

Flight, July 1, 1920

FLIGHT

The
AIRCRAFT
ENGINEER
&
AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport
OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

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Flight

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DIARY OF FORTHCOMING EVENTS.

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

- July 3 ... Air Tournament at London Aerodrome, Hendon, in Aid of R.A.F. Memorial Fund
- July 9 to 20 ... S.B.A.C. International Aero Exhibition at Olympia
- July 17 to 31 ... Seaplane Contests at Antwerp
- July 24 ... Aerial Derby at Hendon
- Aug. 3 ... Air Ministry Competition (Large and Small Type Aeroplanes)
- Aug. 28 & 29 ... Schneider International Race, Venice
- Aug. 1 ... Air Ministry Competition (Seaplanes)
- Sept. ... International aviation week (with competitions) at Brescia, Italy
- Sept. 8, 9 ... Fédération Aéronautique Internationale Conference, Geneva
- Sept. 10 ... Gordon-Bennett Aviation Cup, France
- Oct. 2 ... Gordon-Bennett Balloon Race, Indianapolis, U.S.A.

EDITORIAL COMMENT



The Committee on Civil Aviation

THE Advisory Committee on Civil Aviation has recently made a report to the Secretary of State for Air on the question of Government assistance for the development of civil flying. The Committee premises that in view of the widespread nature of the Empire and the undeveloped state of transport in many parts of it, the definite possibilities for transport by air which are offered should be exploited. That much is beyond question, and has been set forth at length in these pages many times.

The Committee then goes on to pronounce that the existence of a healthy civil aerial transport industry would tend to ensure the supply of material to the Royal Air Force and to reduce the cost. Conversely, the lack of development of aerial transport would entail a manufacturing industry supported almost exclusively by Government orders for the R.A.F. Further, it is to the interest of the community to speed up communications to other countries and to outlying parts of the Empire, and it is contended that by the development of civil aviation this object can be attained. Finally, it is of the highest importance that British prestige in air-development won during the War should not be lost. With all of which we cordially agree, as those who have followed the trend of our comments upon the future of civil flying will already be assured. There is no need here to traverse all the arguments set forth in detail by the Committee in arriving at its recommendations, especially as the report is given in full elsewhere in these pages. These follow lines which have become perfectly familiar to all who have taken more than an ephemeral interest in the subject of our future in the air. We can, therefore, proceed to a consideration of the recommendations as set down by the Committee.

The main recommendation is that direct assistance should be given, limited to a sum of £250,000, within the two financial years 1920-1 and 1921-2, and that payments to airlines operating on scheduled routes should be based on a basis of 10 per cent. of the total gross revenue (excluding

earned by the carriage of passengers, mails, or goods. No differentiation should be made with regard to the class of load carried, and the payments should be allotted on the return for each period of three months treated separately, provided the company can show that, on a minimum of forty-five days in each period of three months (or such other factor of regularity as may be determined later by the Air Ministry), flights have been completed in both directions by aircraft of British manufacture and with British engines within an agreed maximum number of hours. For the purpose of checking the revenue earned, it would be necessary for the company to submit to departmental inspection all books, receipts and vouchers in support of their claim. A further condition of the grant should be that the details of the cost of maintaining and operating the service should be produced annually for inspection by the Government.

The Committee thinks that the approved routes should be: London-Paris and approved extensions therefrom; London-Brussels and approved extensions; and an approved route, as for example England-Scandinavia, on which the possibilities of a service employing flying boats or "amphibian" machines, or a mixed service of sea and land aircraft, can be demonstrated. Under the recommendations any company intending to run on the routes and notifying the Air Ministry of this intention would become an "approved" organisation by fulfilling the conditions laid down as to speed and regularity of service. The Committee is of opinion that a grant for an air service in this country should not at present be made. If, however, satisfactory proposals are put forward for internal services, or for a service between Great Britain and Ireland, the extension of the principle of State assistance for this purpose may, the Committee, thinks, be considered at a later date.

Good,
so far as
They Go

These recommendations may be said to be good so far as they go. A quarter of a million spread over two years is not a great deal of money, especially when we consider all that is required to make an initial success of civil flying. We are not inclined to cavil at it, however, for two reasons. In the first place, there is reason to believe that the existing services are working on a very narrow margin between profit and loss, and that a subsidy of 25 per cent. on their gross earnings, as suggested by the Committee, would put them beyond financial anxiety for the immediate future. It would, moreover, give those responsible for them encouragement to extend, which is what is wanted more than anything else at the present juncture. Although aviation has admittedly made enormous strides during the past five years, and there is every reason to believe in the future of its development, those who are carrying on the existing services are in fact pioneering a new form of transport, and have thus embarked upon an enterprise which has no ascertained data to indicate whether or not they can be run as a commercial success. They believe, and we believe, they can, but the facts being as they are there is every reason why the present proposal should be one of "ganging lengthly experience shall length and weakness of it may be pointed out of the Com-

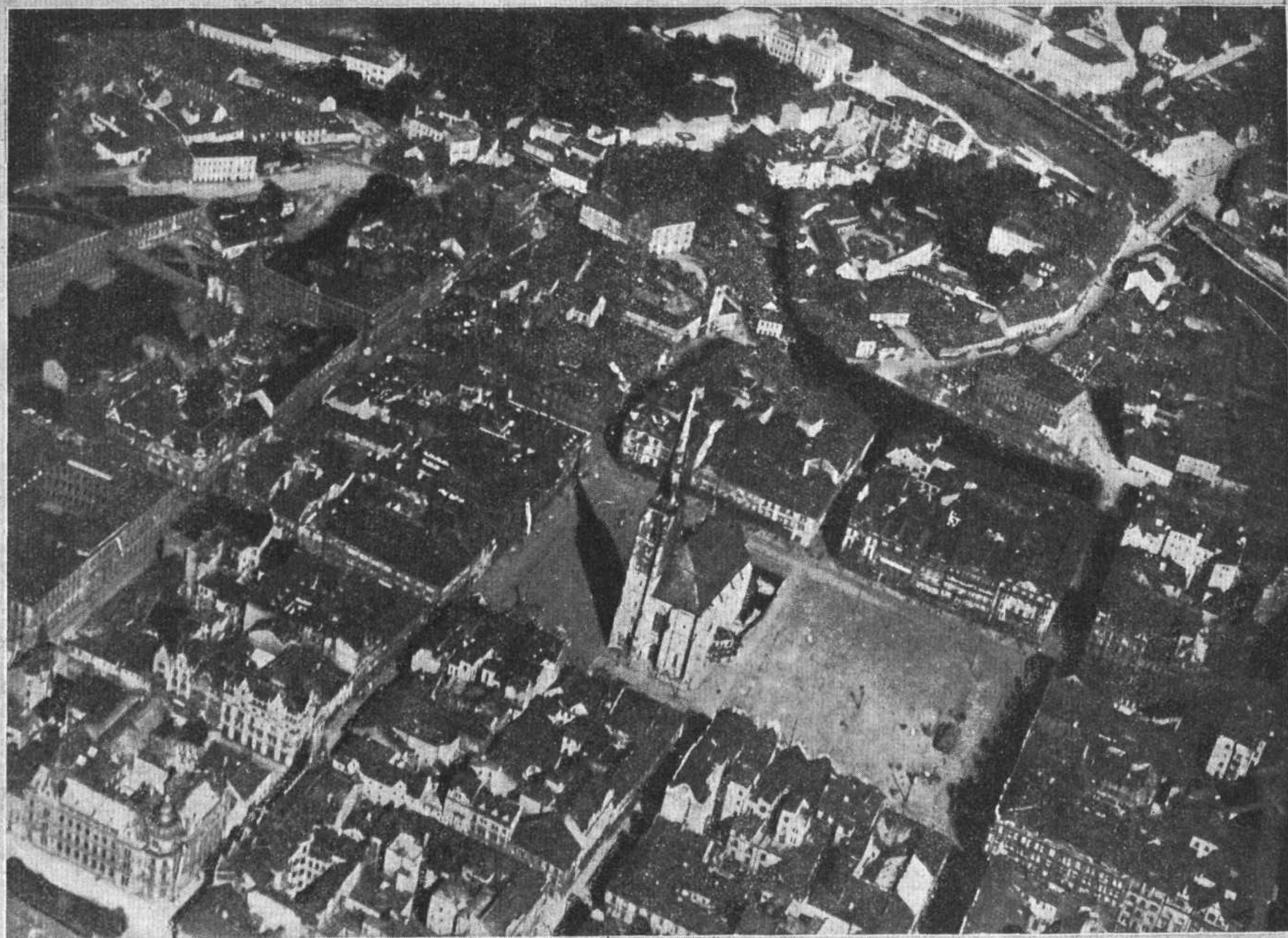
would enable these pioneers to develop more rapidly and to secure the essential knowledge without which we cannot expect to see civil aviation become the potent factor in transport we are assured it is destined to be. We do not for a moment venture to criticise the Committee because of the relative smallness of the subsidies recommended or for limiting their scope. The nation's finances are in a bad way, and even a quarter of a million makes a difference to the taxpayer who has to find the money. Indeed, were it not that we hold such strong views on the paramount necessity of building up a strong reserve to the fighting Air Service, and that we think with the Committee that this is the cheapest way to secure safety from attack by the air, we should almost be inclined to subscribe to the Minority Report of Sir Hugh Trenchard, of which more presently. As it is, however, we have not the slightest hesitation in endorsing the recommendations of the Committee, which we trust to see translated into action before many weeks are past.

Sir H. Trenchard's Disagreement
The Chief of the Air Staff finds himself unable to sign the Majority Report, although he expresses himself as being in agreement with a large part of it.

In a Minority Report he declines to endorse the subsidy recommendations on the grounds that (1) the basic question at issue, *viz.*, what is the precise object of keeping civil aviation alive, does not appear to have been adequately examined; (2) that the Committee too lightly brushes aside the fundamental objections to the principle of subsidies, and the evil consequences arising from them; (3) that sufficient consideration does not seem to have been paid to the need for economy; and (4) that civil aviation, on the basis of the indirect assistance so far recommended, has not been proved to have failed, as the Majority Report implies.

He asks whether civil aviation is to be maintained for commercial purposes only, or to provide a reserve for Imperial defence, or for both purposes. If, he says, the reason is commercial, then the policy of subsidies stands self-condemned. If, on the other hand, it is contended that civil aviation must be helped in order to provide a reserve for Imperial defence, Sir Hugh Trenchard says that in his opinion there is no urgency existing at the present moment in view of the paramount necessity for stringent national economy. He submits that the wisest policy is to build up Service aviation for the present on what may be termed a policing basis, and to add at a later date what is necessary towards giving us the necessary powers of expansion in case of a big war. He finally recommends that it is not advisable to give direct subsidies to aerial transport companies for work done, and does not think the necessity has yet been shown for doing so. It would be preferable, he thinks, to allot the money suggested for subsidies to design and research by placing more orders for experimental machines with certain approved companies. If, he concludes, the subsidy is granted, then he is in agreement with the suggestions made in the Majority Report for its application.

It is with the utmost regret that we find ourselves directly opposed to the views of the Chief of the Air Staff. In the beginning of his Report he appears to be obsessed by the necessity for exercising economy, on the main ground that the nation is



PLZEŇ (PILSEN) FROM ABOVE : This city, one of the most important, next to Prague, in Bohemia, contains many beautiful and interesting buildings. The large Square, shown above, into which lead ten streets, is used as a market-place—particularly on occasions of certain yearly fairs—and the Church of St. Bartholomew, in the centre, is a fine example of late thirteenth-century Gothic architecture. On the north (left) side of the Square is the fine sixteenth-century Town Hall—hanging from which may be seen a long banner. Immediately under the latter can be seen the monument of the Plague of 1680. Many Italian master-builders were in this city during the sixteenth century, and several houses still bear traces of the Italian Renaissance

notable to spare the money for the subsidisation of civil flying that he is against the majority of the Committee. This crying need for economy and yet more economy runs right through his Report, until, greatly to our surprise, we find at the end that the motive apparently underlying his opposition to his colleagues is the desire to secure the money for the development of the Service side of aviation. We would not wittingly do Sir Hugh Trenchard the smallest injustice, but that is the plain meaning of paragraph (ii) in Section 5 of his Minority Report, which refers to spending the money on placing orders for experimental machines with certain approved firms. Thus we get down to a difference of opinion between two opposing schools of thought—the one which thinks that Imperial defence can be best served by the direct encouragement of civil aviation and the consequent building up of a great reserve of material and *personnel* ready and trained to expand the fighting Service in case of war, and the other which holds that we can best prepare by an expansion of the latter. Our own view is that the former school is the nearer right and that we can best provide against the necessities which will arise if ever we become involved in another war by training civilian pilots who will in the meantime be creating instead of dissipating wealth, at the same time maintaining the fighting Service at a level adequate to present needs. Even on the ground of economy, on which the Chief of the Air Staff lays so much stress, such a course is to be recommended. How far will a quarter of a million go in the expansion of the fighting Air Service? We cannot say, but it is definitely certain that it would be better employed in the alternative way. However, there is very little need to labour this particular point. Gen. Trenchard is in a minority of one in so far as the opinions of the Committee are concerned. He also has against him the overwhelming consensus of opinion of those who have studied the question from both the military and the civil points of view. At that the matter may be left for the present.

“Air Specials”

The success of the London-Paris air service is beginning to be appreciated by the business community. This is reflected in the figures relating to the numbers of passengers carried by aeroplane between the two capitals, which show that during the five weeks ending on June 13, over 700 people took advantage of the speed and certainty of the service to save in the aggregate many hundreds of hours of valuable time. One lesson that has been learnt is that an aeroplane service differs essentially from the train or boat in that it consists of a large number of independent small units which are able to operate irrespective of the number of passengers desiring to be carried. In this way: that whereas the train is a fixed unit and must proceed at its scheduled time,

irrespective of whether it is overcrowded or partially empty, the number of aircraft to be employed on any particular route on any given day can be adjusted to the needs of the moment. What this means in reduction of running costs is too obvious to need stating.

More important than this is the power of expansion possessed by the aeroplane service in comparison with other forms of transport. The way this works in connection with the London-Paris service is eloquent of the results which can be attained in this direction. Suppose, for instance, two travellers who have taken single tickets to Paris to just miss the scheduled mail. For an extra fee of £9 they can charter a special machine and be in Paris as soon as the passengers by the mail. In a case where two passengers desire to proceed in haste to the French capital they can, for an extra fee of £22 4s. over the cost of the return ticket, charter a small machine which will fly them over and bring them back at any time to suit the exigencies of the business they have in hand. No other form of transport is at once so accommodating and so low in cost. Yet even now there appear to be some who doubt if commercial aviation is a business proposition!

The Aero Show

There is very little that we can usefully add to what we have already said about the forthcoming Aero Show at Olympia. As the time draws near for its opening it becomes more and more certain that this Exhibition of 1920 will far surpass in wonder and in interest any Show of the kind which has ever been held in Britain or elsewhere. It would be useless even to attempt to indicate in advance the enormous strides which the Show will demonstrate have been made since last a function of the description was housed under the roof of Olympia. As a matter of fact, it would be useless in any case, even had we the comparative details before us. So great has been the progress made in the interval that it simply cannot be measured in any terms which would give an adequate impression of where we stood in 1913 and how far in advance of that point aviation is in this present year of grace. Then aviation and the aeroplane were regarded as having possibilities. The reliability of the machine and its power plant had been demonstrated by such flights as the London-Manchester and from Salisbury Plain to Montrose, but even these were regarded as in the nature of freak performances, attended by a great deal of luck. Only the enthusiast really believed that aircraft would in the years to come be an effective factor in transport. A lot of water has passed beneath the bridges since then. We shall not attempt to show what the progress has been. As we have said, it would be useless in any case. Besides, there is the Show itself to drive home the lesson to all who care to read it. It remains only to say that the Show will open on Friday, the 9th inst., and will remain open until the 20th.

The Memorial Pageant at Hendon

On Saturday next all roads will lead to the London Aerodrome, Hendon, where the great aerial pageant in aid of the R.A.F. Memorial Fund will take place during the afternoon. From the provisional programme which has been drawn up it is evident that the Royal Air Force is determined that this meeting shall put the best of the pre-War Hendon meetings completely in the shade. There will be races, one between half-a-dozen Avros and another—a relay event—between teams comprising a Bristol Fighter, a Sopwith Snipe and an Avro, and in the latter case visitors

have an opportunity of getting their full measure of excitement for there are a dozen or so passengers' seats vacant at £10 10s. each. There will be a balloon “strafe,” in which a “Rupert” will be shot down in flames by a famous “Ace,” the balloon officer escaping by parachute, while demonstrations of “dog-fights,” trench-strafting, bombing and trick flying will keep things lively right through the afternoon. It is probable that the R. 33 and the N.S. 7 will cruise over the ground and drop members of their crews by parachute.

The officer in charge of the pageant will be Air Vice-Marshal Sir J. M. Salmond, K.C.B.

AIR MINISTRY NOTICES

Swiss Customs Station for Aircraft

It is hereby notified that:—

The mooring place for seaplanes and flying boats at Geneva is at the Eaux-Vives, which is on the eastern shore of the Lake of Geneva, and opposite the entrance to the park "La Grange." All such aircraft arriving from or leaving for foreign countries must report to the Customs official at the above-mentioned mooring place; arrival at or departure from any other place on the Lake of Geneva is strictly prohibited, and this prohibition is also applicable to arrivals from or departures for the interior of Switzerland. The Customs Office Geneva-Lac (Rue de la Scie 7), or the Customs Post Geneva-Lac (Rue de Lac 5), should be advised of any pending arrival from or departure for a foreign country.

The above regulations are applicable only to seaplanes and flying boats which descend in the Geneva Consular District; further regulations will be promulgated concerning other Consular districts in Switzerland.

The above notice amends A.M. Notice to Airmen No. 38 of April 9, 1920

(Notice to Airmen No. 72.)

Seaplanes at Plymouth

It is hereby notified that:—

An area extending 200 yards in any direction from Mount Batten Breakwater, Plymouth Harbour, is kept clear of all small surface craft in order that seaplanes and flying boats may manoeuvre in this area.

(Notice to Airmen No. 73.)

Navigation Stations

It is hereby notified that:—

The following directional finding Navigation Stations have been established in France:—

Station.	Call Signal.	Lat. N.	Long.
Barre de l'Adour..	FLO	43 32	1 31 W.
Bernieres ..	UHN	49 20	0 25 W.
Brest-Capucins* ..	HUD	48 19	4 35 W.
Brest-Guipavas ..	FHA	48 27	4 27 W.
Casablanca-Chetaba†	FCH	33 35	7 34 W.
Chemoulin ..	FUH	47 14	2 18 W.
Cherbourg..	FFC	49 37	1 36 W.
Le Havre..	FFU	49 32	0 07 E.
Lorient ..	FFL	47 44	3 21 W.
Ouessant-Pen ar Roch‡	FHY	48 26	5 06 W.
Pointe du Raz ..	FPU	48 02	4 44 W.
Rochefort-Soubise ..	HOB	45 56	1 00 W.
Treguier ..	FQC	48 50	3 14 W.

* Brest-Capucins answers FFK.

† Casablanca-Chetaba answers CNP.

‡ Ouessant-Pen ar Roch answers FFF.

The regulations for French D.F. Stations are similar to those of the United Kingdom.

R.N. Directional Navigation Stations in Great Britain were notified in Notice to Airmen No. 64.

(Notice to Airmen No. 74.)

AVIATION IN GERMANY

ALTHOUGH it makes a somewhat belated appearance, the report on Industrial and Commercial Conditions in Germany at the close of the year 1919, is valuable as showing that conditions in Germany are not always as they seem to be to certain sections of the Press. The following is the section of the report dealing with aviation:—

1. The German Government and German industry have realised that commercial aviation is in too early a stage to be nationalised, and they have decided to leave its development to private enterprise, possibly aided by Government subsidies. The general view seems to be that aviation can only be made to pay in course of time if it is run on absolutely international lines, and for this reason the Government will probably take over aerodromes in suitable localities and go to considerable trouble and expense in providing them with up-to-date equipment so as to attract trans-continental aerial traffic. Germany favours the plan of the erection of a large aviation station and harbour on the Zuider Sea as a junction for North European aerial traffic in the construction of which it hopes its specialised industries will be able to participate.

2. Since October 1, 1919, a special department has been formed in the Ministry of Transport (*Reichsverkehrsministerium*) for dealing with questions of aviation and motoring (*Reichsamt für Luft- und Kraftfahrwesen*). This department will have the duty of organising the official automobile and aviation services and drawing up the rules and regulations for civilian motoring and flying.

3. An attempt is being made to consolidate German commercial aviation and to assure the adoption of a uniform policy by the creation of a "Union of Aerodromes and Aerial Transport Concerns." The movement was originated by Major von Tschudi, who took a prominent part in aviation staff work during the War, and aims at uniting in one body towns and concerns which own aerodromes, aerial transport companies and aircraft constructors. The statutes are being worked-out by a committee chosen at the inaugural meeting.

4. The actual flying done since the Armistice has naturally been small, as fuel could only be obtained with the greatest difficulty; apart from a few lines for aerial post which attempted to maintain a regular service, flights were only undertaken to order.

The most consistent performance was put up by the small airship "Bodensee," built on the Zeppelin principle and owned by the "Deutsche Luftreederei," which is the aviation department of the Hamburg-America-Line. The airship carried out just over 100 flights between August 25 and December 2, nearly all on the route Berlin-Friedrichshafen. During this period it covered 50,000 km., and carried 2,322

passengers and 28,845 kg. of luggage. It is being reconstructed and enlarged during December and January, and is to commence flying again in February, 1920.

The same company also maintained an aerial postal service during the first half of the year, but it had to be abandoned on August 1 owing to the impossibility of procuring petrol. The service began on February 5, 1919, on the line Berlin-Weimar, and was gradually extended to Leipzig, Hamburg, Brunswick, Hanover, Gelsenkirchen, Warnemünde, Swinemünde and Westerland on the island of Sylt. During the six months 1,430 out of 1,532 flights (93.3 per cent.) were accomplished successfully, 4.7 per cent. had to be interrupted for technical or meteorological reasons, and only 2 per cent. had to be abandoned owing to the weather. 556,155 km. were flown, 1,574 passengers were carried, and 57,081 kg. of newspapers, 20,963 kg. of letters and 5,098 kg. of parcels transported.

During the partial stoppage of railway traffic in November a temporary revival of the service took place on the lines Berlin-Leipzig and Berlin-Breslau; the Rumpler works also employed 30 machines in passenger traffic during this period, chiefly on the lines Berlin-Leipzig and Berlin-Augsburg-Munich.

Aerial services were also planned between Munich-Nuremberg-Leipzig, Munich-Würzburg-Frankfurt-on-Main and Munich-Vienna (by the Bavarian Air Lloyd) and Berlin-Copenhagen and Berlin-Dresden-Prague (by a Saxon company), but if they ever materialised at all it was only for a short time.

In January, 1920, the aerial post was resumed on a limited scale, and the Deutsche Luftreederei is running a service of hydroplanes from Sassnitz to Warnemünde as a link in the journey between Hamburg and Sweden.

5. Aircraft construction has of necessity been confined to a minimum, partly on account of the shortage of all necessary materials, partly owing to the general impoverished state of the country, and partly to the uncertainty as to the interpretation of the terms of the peace treaty. Little has been done beyond the building of new types for experimental purposes, and of a second Zeppelin like the "Bodensee."

In September the Automobil u. Aviatik A. G. at Leipzig had completed a large machine with a span of 43.5 m., length of 22.5 m. and a height of 6.5 m. It has four Benz motors, two of 250 h.p. and two of 500 h.p., and can carry 18 passengers with luggage, in addition to a crew of 6, and fuel for 8-10 hours at an average speed of 125 km. per hour.

The Junkers company in Dessau have brought out a interesting type of monoplane made almost exclusively of metal and without any wiring or struts. It has a radius of 3 to 6 hours with 6 and 4 passengers respectively at an

average speed of 170 km. per hour. The span is 14.82 m., length 9.50 m., height 3.1 m. The motor is a 160 h.p. Mercédès.

The Fokker works have produced a somewhat similar type and Siemens-Schuckert have designed a commercial aeroplane for which much the same details are given.

Benz are said to have worked out the plans for a very large and powerful machine with an exceptionally wide radius of action.

It is to be expected that the Germans will come forward with a series of new and varied designs when they are in a position to resume aircraft reconstruction to any extent.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

COMMITTEE MEETING

A MEETING of The Committee was held on Wednesday last, June 23, 1920, when there were present:—Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., in the Chair, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., Air-Commodore E. M. Maitland, C.M.G., D.S.O., R.A.F., Lieut.-Col. Alec Ogilvie, Lieut.-Col. Mervyn O'Gorman, C.B., and the Secretary.

Election of Members.—The following New Members were elected:—

Capt. Thomas Anthony Gladstone (Late R.A.F.).
Capt. Esmond Morse, R.E. (T.).

Fédération Aéronautique Internationale Conference, Geneva.—The following were appointed to represent the Club at the Conference of the Fédération Aéronautique Internationale in Geneva on September 8, 9 and 10, 1920:—

Lieut.-Col. F. K. McClean.
Lieut.-Col. Alec Ogilvie.
Lieut.-Col. Mervyn O'Gorman, C.B.
Mr. Harold E. Perrin, Secretary.

Certificate of Performance.—The following Certificate of Performance was granted:—

CERTIFICATE OF PERFORMANCE

(Under the Regulations of the Fédération Aéronautique Internationale)

CLASS "C" No. 4B

Type ..	..	Nieuport L.S. 3.
Constructor ..	..	The Nieuport and General Aircraft Co., Ltd., London.
Motor ..	..	340 h.p. A.B.C. Dragon Fly 1A.
Pilot ..	..	L. R. Tait Cox.
Place ..	..	Martlesham Heath, Suffolk.
Date ..	..	June 17, 1920.

Performance. Greatest speed over a straight line course of 1 kilometre.

267.7 Kilometres per hour (= 166.4 Miles per hour).

Deputation to the Under-Secretary of State for Air

On March 30 a Deputation from the Royal Aero Club was received by the Under-Secretary of State for Air on the question of a scheme proposed by the Club for providing facilities for its Members to keep up practice in the three branches of Aeronautics, viz. flying machines, airships and balloons.

A reply was received from the Air Ministry on June 14, 1920, regretting they were not in a position to assist the Club in the provision of aircraft.

The Aircraft Disposals Co. has submitted a proposal for the provision of aeroplanes for the use of Members of the Club which is now under consideration by the Committee.

The First 100 British Aviators

H.R.H. THE DUKE OF YORK has signified his intention of being present at the dinner to the first 100 British aviators, and the pioneers of aviation, on Monday, July 12. There are already definite promises of the attendance of 42 survivors of the first 100, 72 other aeronautical pioneers (inventors, designers, etc.), including three ladies. To meet these guests a large number of representative men will be present, including Maj.-Gen. Seely, Lord Desborough, Lord Montagu, Sir W. Beardmore, Sir Capel Holden, Sir W. Joynson-Hicks, Air Vice-Marshal Sir Godfrey Paine, Sir R. T. Glazebrook, Mr. J. L. Garvin, Mr. H. G. Wells, Maj.-Gen. Sir R. M. Ruck, Air Vice-Marshal Sir J. M. Salmond, Sir Napier Shaw, Lord Sydenham, Sir S. Waring, Sir C. Wakefield, the Air Attachés for the United States, French and Italian Embassies.

"Airships for Commerce"

At the House of Commons on Monday last Air-Com-

The Committee is also dealing with the question of the purchase of balloons for the use of Members.

FLYING SERVICES FUND COMMITTEE

A Meeting of the Flying Services Fund Committee was held on Thursday last, June 24, 1920, when there were present:—Group-Capt. C. R. Samson, C.M.G., D.S.O., R.A.F., in the Chair, Mr. Chester Fox, Squadron-Leader T. O'B. Hubbard, M.C., R.A.F., and the Secretary.

Applications for Assistance.—Twenty-seven applications for assistance were considered, and Grants and Allowances were voted amounting to £279.

SIXTH INTERNATIONAL AERO EXHIBITION

Olympia, July 9-20, 1920

As on previous occasions, Rooms in the Princes Gallery, Olympia, will be reserved for the use of Members of the Royal Aero Club during the Aero Exhibition, July 9-20, 1920.

THE FLYING SERVICES FUND

(Registered under the War Charities Act, 1916.)

Administered by the Royal Aero Club.

For the benefit of *Officers, Non-Commissioned Officers and Men* of the ROYAL AIR FORCE who are incapacitated while on duty, and for the widows and dependants of those who are killed or die from injuries or illness contracted while on duty.

Committee:

H.R.H. THE DUKE OF YORK, K.G. (Chairman).
Lieut.-Col. A. DORE, D.S.O.
Mr. CHESTER FOX.
Squad.-Leader T. O'B. HUBBARD, M.C., R.A.F.
Group-Capt. C. R. SAMSON, C.M.G., D.S.O., R.A.F.

Honorary Treasurer:

The Right Hon. LORD KINNAIRD.

Bankers:

Messrs. BARCLAYS BANK, LTD., 4, Pall Mall East, London, S.W. 1.

Secretary:

H. E. PERRIN.

Subscriptions

	£	s.	d.
Total Subscriptions received to May 31, 1920..	17,137	9	2
Miss Eleanor Bairdsmith	1	1	0

Total, June 28, 1920 17,138 10 2

**Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.**

H. E. PERRIN, Secretary.

modore E. M. Maitland gave a lecture on "Modern Airships" to a representative gathering of members of both Houses of Parliament.

The lecture was practically the same as that given before the Royal Society of Arts some time ago and reproduced in FLIGHT of April 22 and 29.

Sir W. Joynson-Hicks, who presided, said there were three important matters with regard to aviation that had not yet been made public. The first was that the L. 71, the latest and best German airship, might arrive in England at any moment, under the Peace Treaty. The next point was that the Zeppelin Company was in negotiation with the Hamburg-America Line to start jointly a commercial airship service, and if the airships were not ready this summer, they would certainly start next summer. His third point was that we had spent a total of £40,000,000 on airships during and before the war.

GOVERNMENT ASSISTANCE FOR THE DEVELOPMENT OF CIVIL AVIATION

Report of the Advisory Committee on Civil Aviation

THE following report of the Advisory Committee on Civil Aviation was issued as a White Paper on June 26. The Committee consists of Lord Weir of Eastwood (late Secretary of State for the Royal Air Force) (*Chairman*), Sir James Stevenson, Bart. (Member of the Army Council and of the Air Council) (*Vice-Chairman*), Mr. L. Bairstow, C.B.E., F.R.S., Mr. Sidney A. Boulton (Chairman of Lloyds), Colonel J. T. C. Moore-Brabazon, M.C., M.P., Lord Inchcape of Strathnaver, G.C.M.G., K.C.S.I., K.C.I.E., Sir W. Arthur Robinson, K.C.B., C.B.E. (Secretary of the Air Ministry), Mr. H. White-Smith, C.B.E. (Chairman of the Society of British Aircraft Constructors), Major-General Sir Frederick H. Sykes, G.B.E., K.C.B., C.M.G. (Controller-General of Civil Aviation), Air Marshal Sir Hugh M. Trenchard, Bart., K.C.B., D.S.O. (Chief of the Air Staff), with Mr. F. G. L. Bertram, C.B.E. (*Secretary*).

To The Rt. Hon. WINSTON S. CHURCHILL, M.P.,
Secretary of State for Air.

1. *Terms of Reference.*—The terms of reference which we have received on the present occasion are to "consider the essential steps in the national interest which the Government should take to develop Civil Aviation, bearing in mind the need for the utmost economy."

2. *General Observations.*—We begin by observing that the Air Ministry was established to discharge the functions of the State relating to military and civil aviation and its development. We interpret the above reference as an instruction to make recommendations as to the character and application of those functions in the sphere of civil aviation.

Any consideration of civil aviation must necessarily include reference not only to the aerial transport services which have come into existence since the Armistice, and which in the national interest we are bound to regard as a nucleus from which greater development will follow, but also to the aircraft manufacturing industry, the future of which must depend not only on the requirements of the Royal Air Force, but also on those of civil air transport. If the industry is restricted to the manufacture of Service machines, its magnitude would be considerably curtailed.

In making these recommendations, therefore, as to the action which may properly be taken by the State to assist the development of a novel means of transport, we must consider it not only in the light of its present and potential value as a commercial service, but also in the bearing it may have on an industry whose dimensions would otherwise be governed solely by the needs of one arm of the fighting Services of the Crown. We think it necessary, however, to place on record with the utmost clearness that no action on the part of the State which we should regard as justifiable nor any development of private enterprise which is yet within sight, can save the industry from great reduction from its War-time magnitude.

The exigencies of War brought about a forced development in the aeroplane for fighting purposes and a corresponding development in the facilities and methods of its manufacture. To-day, one of the main lessons to be learned from the War appears to be the appreciation of the possibilities of aircraft as vital in future warfare and at the same time as a new and promising, although little tried factor in the fundamental industry of transport and communication.

The inter-action of these factors, together with the limited experience so far obtained in British civil aviation, renders the problem of laying down a satisfactory State policy one of abnormal difficulty. We have not approached the problem from the point of view that what we have to do is to make recommendations simply on the basis that civil aviation and the aircraft industry must be kept alive. Our proposals are based on the implication in the terms of reference that it is in the national interest that the State should play a definite part in encouraging and helping the initial development of a new public service. We are persuaded that, in the long run, development must depend not on Government action, but on the courage and enterprise of the members of the community who are interested. The function of the State is to encourage and assist but not to operate or initiate. A healthy industry can only find a sure foundation in individual faith, adventure and effort. State help must be determined strictly with reference to the importance of the national interests involved.

Applying this criterion of national interest to the sphere of civil aviation, we make the following observations:—

(a) In view of the widespread nature of the British Empire and the undeveloped state of transport in many parts of it, the definite commercial possibilities for transport by air which are offered should be exploited.

(b) The existence of a healthy civil aerial transport industry would tend to ensure the supply of material to the Royal Air Force and to reduce the cost. Conversely, lack of development of aerial transport would entail a manufacturing industry supported almost exclusively by Government orders for the Royal Air Force.

(c) It is to the interest of the community to speed up communications to other countries and outlying parts of the Empire. It is contended that by the development of civil aviation this object can be attained.

(d) It is of the highest importance that British prestige in air development won during the War should not be lost.

3. *Policy with regard to British Civil Aviation, and Assistance already given.*—We proceed to note that a definite policy in regard to civil aviation has already been laid down and acted upon in this country by the Government, and we would deprecate the tendency to belittle British effort, both private and public, since the Armistice, or to display impatience with the slow rate of progress. The hardships and difficulties in the way of the rapid development of civil aviation are great, and, on reviewing the situation, we are impressed by the wide scope of the action which has already been taken and the progress which has resulted.

A brief statement of the steps taken by the Air Ministry to carry out the recommendations of policy which have been made from time to time will be found as an Appendix to this Report, from which it will be seen how far the Government has already assisted in laying the foundation of British civil aviation.

Normally the amount of indirect State action and assistance thus described might be held to be sufficient and, when we considered the problem of "Imperial Air Routes," we concluded that we should not be justified in making any recommendations beyond those contained in our Report.* Our present inquiry has confirmed us in the conviction that the grant of such indirect assistance is essential, and it has given us satisfaction to learn that this policy has been accepted by the Government and is in course of execution.

The problem which we have had to consider on the present occasion has been whether the grounds of national interest are sufficiently strong to justify us in going further and passing from the sphere of indirect to the sphere of direct State assistance.

4. *Previous Report—Agreement with considerations contained therein.*—In considering the possible development of Imperial Air Routes, we concluded that in present conditions the principle must be adopted of concentration on one route, viz. Egypt to India. Reviewing the situation nearer home, we are again impressed by the fact that what is still required is not dissipation but concentration of effort on a very few routes with the object of connecting a body of experience in the operation of transport services on which the wider progress which we foresee can be based.

The British Isles, owing to climatic conditions and their relatively small area, are not suitable for an early development of civil aviation. In civilised and well-developed countries where an air service has to compete with express trains running at night between main centres of population, air transport can only be established with success if it can offer an equally reliable and substantially faster service. The air possesses only one asset, that of speed, but this advantage cannot be fully utilised until much greater experience of night flying has been obtained and the necessary ground organisation to make this practical and safe has been more fully developed.

We are therefore of opinion that more suitable fields for private enterprise and for the exploitation of British air transport services exist in the Dominions and Colonies and between Great Britain and foreign countries, and although we have carefully considered the advisability of recommending State assistance for long-distance routes within the British Isles, particularly in connection with the transport of mails,

* Cmd. 449. "Report on Imperial Air Routes."

we have arrived at the conclusion that such air services would not in present conditions provide advantages so far superior to methods of transport already in existence as to warrant their establishment. In accordance with the historical development of new industries, however, it rests with British private enterprise to pioneer the way, to develop types of machines, and to establish experimental and demonstration routes, in order that the experience so gained may serve as a guide for the development of British civil aviation further afield. There can be no doubt that British aircraft constructors and designers can interest and attract potential customers and capitalists not only in Europe, but also in the Dominions, Colonies and foreign countries more successfully and easily by showing demonstration services actually in operation and running regularly between London and other European capitals than by any other form of advertisement.

It must be recognised, however, that the present reduction in aircraft manufacture automatically lessens the rate of progress in the development of design and the advantages attendant thereon, as designing staffs can only be kept in being to the extent that the demand for machines warrants. This demand should come from the Royal Air Force for machines of a military type and from the Transport Companies to a large extent for those of a commercial type. The R.A.F., however, are left with a large fleet of aeroplanes as the surplus of war, and can, at present, place orders only for experimental machines, while the placing of orders for civil machines by the Government cannot be justified. The demand and the specification of requirements must in every case emanate from the user, whether military or civil.

There is good reason to fear that unless a sound nucleus of designing staff is retained by the aircraft constructors, this country will necessarily lose the pre-eminent position in design which it has occupied, and will soon lag behind better supported foreign competitors.

We cannot ignore the progress of other nations in aircraft design, and this is a factor to be borne in mind in considering the extent to which the Government should place orders for experimental machines.

We are therefore of the opinion that the Air Ministry should make every effort to maintain the designing staffs at an efficient level, by placing as many orders as possible for experimental military machines, coupled with every possible assistance to encourage firms to develop aeronautical research.

5. *Evidence with regard to existing Transport Services.*—With regard to the services already in existence between London and Paris and London and Brussels, we obtained evidence of the greatest value from Major-General Sir S. Brancker, K.C.B., of the Aircraft Transport and Travel Co., and from Mr. Handley Page; while Sir Evelyn Murray, K.C.B., Secretary of the General Post Office, gave much interesting information on the question of the carriage of mails by air. The evidence given by Sir S. Brancker and Mr. Handley Page afforded a complete endorsement of the views of the Committee on the value of demonstration services, and we desire to place on record our conviction that British civil aviation owes a real debt of gratitude to Mr. Holt Thomas and Mr. Handley Page for the pioneer efforts made by their companies in this new field of activity.

From the evidence given, several important deductions may be drawn:—

(i) Reliability and regularity of service involve the use of relatively high-speed machines, which in turn considerably increases the total cost of operation.

(ii) A less regular service, that is, one which may not operate in bad weather, equipped with machines of a relatively low speed, can be maintained at running costs which appear to be even now commercially sound, provided that a guaranteed cargo of either mails, passengers or goods can be secured.

(iii) The service to Paris run by the Aircraft Transport and Travel Co. has been very reliable, and a comparison with the figures of the first mail service carried by rail, in the early days of railway development, would, it is thought, show to the advantage of the air mail service to Paris.

(iv) One of the difficulties experienced by the services has been that of regularly filling a substantial percentage of the useful space. Passengers and goods come forward spasmodically, and there is not yet apparently any deep-seated confidence on the part of the public in the reliability of these services, which they have not yet learned to value.

(v) The mail enterprise between London and Paris, which was of a provisional character, has proved to be a failure, but the failure does not reflect in any degree on the flying side of the service. It would appear rather to be due to three causes:—

(a) Insufficient advertisement.

(b) The inconvenience experienced by the public in

being unable to post (air) letters except at certain specified Post Offices in London.

(c) The prohibitive cost of 2s. 6d. per letter.

There does not appear to be any great demand for a daylight exchange of letters between London and Paris, though it is a question how far this apparent absence of demand is due to the causes enumerated above.

(vi) Experience has shown the necessity of special designs for commercial machines and engines.

It is important to emphasise that the existing services have been carried out to a very large extent with surplus war machines acquired at a low valuation, and the replacement of these machines by others of new design, specially built to suit commercial conditions, will involve a further large increase in capital outlay and a consequent increase in the cost of depreciation, thus adding to the total cost of operation.

6. *Consideration of further Temporary State Assistance.*—We have carefully considered a memorandum prepared by the Controller-General of Civil Aviation containing recommendations for the assistance of civil aviation in different directions, and have also had before us various suggestions from other sources; but, bearing in mind the need for exercising the utmost economy in framing our proposals, we have found the arguments insufficient to justify us in putting forward more extensive recommendations than those contained in this Report.

From our review of the general situation, and from the evidence given before us, we have come definitely to the conclusion that, in spite of the indirect assistance so far recommended and in course of being provided, the development of civil aviation so far attained may yet stop short, and that the operational experience which is essential to that development may cease. We think that national interests demand that such a risk should be avoided, and we have accordingly been led to consider whether the provision of a measure of direct assistance cannot be justified.

We record at the outset that we should in no case contemplate the continuation of such assistance as part of the permanent policy of the State. We have dealt with it solely as a matter for consideration during the present critical years when the fortunes of British civil aviation hang in the balance.

It may be held that there is no case for direct State aid at all, and that the proper course is to leave civil aviation to find its own way with the indirect assistance already recommended by the Committee and approved by the Government.

We have come to the conclusion that direct State aid is justified for reasons which have already been in part indicated, and also for the following reasons.

The artificial impetus given by the War to the aircraft industry and the consequent influence on private enterprise lay a responsibility on the State to continue its support in some degree as a temporary measure until sufficient experience has been gained either to place civil aviation in a sound position or to establish that it is not a commercial possibility, or is of small practical value.

Further, there arise considerations of national prestige and national defence which have in the past been held to be strong enough to justify departure from the traditional British policy of leaving trade and industry to take care of themselves. There is undoubtedly serious risk that the lead in aviation attained by this country during the War may be lost unless further assistance is forthcoming for civil aviation. The failure of civil aviation would result, not only in a loss of British prestige in a new and potentially important sphere of commercial activity, but would also react unfavourably on service aviation by depriving it of a reserve of personnel, material and constructional facilities from which to draw in the event of war.

Accordingly, we recommend that the precedents of State aid to which we have alluded be followed in the case of civil aviation for a strictly limited period, and on such conditions as will ensure that, in return for State assistance, private enterprise spares no efforts to place civil aviation on an independent and self-supporting basis. We are persuaded that, whatever State aid be given, final success will depend on the courage, imagination and resource of those engaged in private enterprise and the measure of support given by capital and the community as a whole.

7. *Methods of Affording Direct Assistance.*—We have considered various methods by which a direct grant might be given and the basis upon which it should be assessed, and have approached the problem as involving the transport by air of passengers, goods and mails.

The question of the payment of grants on the basis of the

number of miles covered, or of the number of hours flown, has been discussed, and we have had before us details of the French scheme in operation which is based on this principle. We have been forced to the conclusion that any such scheme of grants is fundamentally unsound, as the grants can be earned without any direct return to the State or community, either by way of experience gained, useful work performed, development of more efficient machines or establishment of regular air routes. We have, therefore, discarded the policy of giving grants on such a general basis.

We have also considered the advisability of making the payment of a grant dependent upon the carriage of a guaranteed load of mails within a fixed maximum time, but have found the practical application of such a system too difficult to warrant its adoption. This method has the further grave defect that it might often involve the State in the payment for certain services which might not, in fact, have been performed.

We have laid down, therefore, as a principle that any grant must be in return for useful work performed, such as the acceleration of mail transport, or for services productive of valuable experience.

We have considered whether these requirements could not be met by an arrangement under which the State set aside for carriage by air some or all of the mail matter on a specified route or routes and invite recognised firms to tender for the work on stated terms. This method is the one which we have already recommended for application to the Cairo-Karachi route.* After due consideration we have been compelled to decide against the extension of this method to the experimental services which we contemplate between this country and the Continent. The distance between London and Paris is too short and the saving in time insufficient to induce the General Post Office to dispense with existing mail services in favour of transport by air. We are advised that the mail contracts which would be of use to the Post Office would be for such routes as London to Rome, where the saving of a clear business day would be practicable. But on these routes we are faced with numerous difficulties. The weather conditions throughout the year are far more treacherous than on the Cairo-Karachi route, international questions are still complicated, and the development of air transport has scarcely attained such perfection as to make it possible to rely on the regularity in present conditions of such a service. We are consequently of opinion that any scheme for the assistance of civil aviation must permit of gradual development and consolidation stage by stage. Bearing in mind these two factors, namely, the difficulties in the way of the immediate inauguration of long-distance services and the present uneconomic position with regard to the carriage of mails over short distances, we have tried to devise a scheme which, while ensuring the utmost economy on the part of the Government, will assist those undertakings which, by the reliability of their service, by the public support that they are able to secure, and by their economic management prove themselves to be most worthy of financial assistance by the State.

8. *Scheme of temporary State Assistance recommended.*—The scheme which commends itself to us limits State financial assistance to a maximum sum agreed beforehand, and makes the amount of the individual grants to Transport Companies conditional on the regularity of the service and proportional to the actual amount of income received from the public using the service, *i.e.*, to the actual work done and useful experience gained.

Moreover, we feel strongly that the relationship between air transport companies and the General Post Office should be placed on a purely commercial basis, and that transport companies should begin dealing with the Post Office, when seeking mail contracts, on an equal footing with railway and steamer companies, thus avoiding the confusion of State assistance with payment for work done.

We believe that the basis upon which our recommendations are framed will assist in making this possible.

We, therefore, make the following recommendations:—

(1) That direct assistance should be given, limited to a maximum sum of £250,000, within the two financial years 1920-21 and 1921-22, and that payments to companies operating on approved routes should be calculated on the basis of 25 per cent. of the total certified gross revenue of each company (exclusive of the Government grant) earned by the carriage of passengers, mails or goods.

No differentiation should be made with regard to the class of load carried, and the payments should be allotted on the return for each period of three months treated separately,

provided that the company can show that, on a minimum of 45 days in each period of three months (or such other factor of regularity as may be determined later by the Air Ministry), flights have been completed in both directions by aircraft of British manufacture and with British engines within an agreed maximum number of hours.

For the purpose of checking the revenue earned, it will be necessary for the company to submit to departmental inspection, when required, all the company's books, receipts and other documents in support of their claim.

A further condition of the grant should be that the details of the cost of maintaining and operating the service should be produced annually for inspection by the Government.

(2) That the "approved" routes should be:—

(a) London to Paris and approved extensions therefrom.

(b) London to Brussels and approved extensions therefrom.

(c) An approved route, as, for instance, England—Scandinavia, on which the possibilities of a service employing flying boats or "amphibian" machines, or a mixed service of sea and land aircraft, can be demonstrated.

The maximum time allowed for journeys between London and Paris, and London and Brussels, should be four hours from aerodrome to aerodrome (or such other time limit as may be determined later by the Air Ministry); and the maximum time allowed for journeys on the extended routes should be proportionate.

(3) That any company intending to run on the routes and notifying the Air Ministry of this intention would become an "approved" organisation by fulfilling the conditions laid down as to regularity and speed of service.

(4) That a grant for an air service in this country should not at present be made. However, if satisfactory proposals are put forward for internal services, or for a service between Great Britain and Ireland, the extension of the principle of State assistance for this purpose may require further consideration at a later date.

April 19, 1920.

WEIR (Chairman).
J. STEVENSON (Vice-Chairman).
L. BAIRSTOW.
SIDNEY A. BOULTON.
J. T. C. MOORE-BRABAZON.
INCHCAPE.
W. A. ROBINSON.
H. WHITE-SMITH.
F. H. SYKES.

F. G. L. BERTRAM (Secretary).

I sign the Report but consider that if the grant is limited to two years and is only payable on earnings it should not be limited to £250,000.

J. STEVENSON.

In signing the Report I endorse the rider put forward by Sir James Stevenson.

H. WHITE-SMITH.

I sign the Report, but in the present state of the country's finances I am not in favour of subsidising any aviation Company.

INCHCAPE.

Report by Air-Marshal Sir Hugh M. Trenchard, Bart.,
K.C.B., D.S.O.

1. Although I am in agreement with a large part of the Majority Report I regret I am unable to endorse the recommendations contained in paragraphs 6 and 8, for the following reasons:—

(a) The basic question at issue, namely, what is the precise object of keeping Civil Aviation alive, does not appear to have been adequately examined.

(b) It seems to me that the Committee too lightly brush aside the fundamental objections to the principle of subsidies, and the evil consequences arising from them.

(c) Sufficient consideration does not appear to have been given to the statement in the Terms of Reference that the Committee must bear in mind the need for the utmost economy.

(d) I am not satisfied at present that Civil Aviation, on the basis of the indirect assistance so far recommended, has failed, as paragraph 6 of the Majority Report implies. I do not think it has had time to prove its value.

2. With regard to (a) and (b), is Civil Aviation to be maintained for commercial purposes only? Or is it required to provide a reserve for Imperial Defence? Or again, is it necessary for both purposes?

If the reason is commercial, then I am of opinion that the policy of subsidies stands self-condemned. It is not a system

* Cmd. 449. "Report on Imperial Air Routes."

on which the British Empire has built up any of its great industries, and its result may be compared with the artificial and weakly growth produced by a hothouse as contrasted with the strong growth due to normal conditions. The only sound basis of any industry primarily designed to meet the needs of commerce is that it shall be self-supporting and forced to maintain itself in a profitable condition by good and economical organisation and administration. A Government grant inevitably tends to weaken this stimulus.

The Committee limit the payment of subsidies to a period of two years. This two years is a time when it is universally admitted that stringent economy by Government is necessary. But is it conceivable that any Government, once the subsidies have been granted, will be able to withdraw them, especially when the money situation will probably be less difficult? If this is so, we shall be committed indefinitely to a policy which is admittedly unsound.

If it is contended that Civil Aviation must be helped in order to provide a reserve for Imperial Defence, then my opinion is that no urgency at the present moment exists in view of the paramount necessity for stringent national economy. I submit that in the interests of economy the wisest policy is to build up Service Aviation for the present on what may be termed a policing basis, and to add at a later date what is necessary towards giving us the necessary powers of expansion in case of a big war.

I fully recognise, however, the necessity for the existence of a certain number of aircraft companies to cater for Service needs, but it must be remembered that, although Service Aviation is at present existing on machines which are the legacy of the late war, the number of machines which will be required in normal years in future will be considerable and in itself sufficient to maintain a healthy industry.

I am firmly convinced that the first essential in the case of Civil, as in that of Service, Aviation is to clear away the rank growth of war. The sooner this is done and the industry reduced to dimensions commensurate with the demands, the sooner will Civil Aviation commence to grow and flourish. The longer the reduction is delayed by artificial means, the longer will a healthy growth, with its roots firmly fixed in the industries of the country, be retarded. The retention of designing staffs is a case in point. I recognise the importance of keeping the development of designs on progressive lines, but I do not think it is necessary to retain large designing staffs to ensure that this is done. The actual designers during the war were very few in number. It is their services which must be retained, and not necessarily those of their staffs, which consisted principally of engineering draughtsmen and the like, who could all be replaced at short notice, but I consider that, in order to keep a certain number of small designing staffs in being, it would be preferable, in place of giving subsidies, to place more orders with selected companies for experimental machines.

3. Apart from the general objection to any system of subsidies, I doubt if they would fulfil their object. The failure of indirect assistance is admitted to be due to the fact of the small demand for the carriage of passengers, goods or mails. Unless this is due to any shortcomings in the services provided, which can be removed by direct subsidies, I fail to see how such subsidies will increase the demand in any way.

Doubts are expressed as to the possibility of commercially paying services between London and Paris and London and Brussels, and the recommendations for subsidies to the companies working these routes are based on the possibility of an extension of the services to Spain, Portugal, Italy, and the South of France. Is it certain, however, that we shall be allowed to carry mails in European countries?

4. In view of the insistence in the terms of reference on the need of economy, it appears to me that whether or not any system of direct assistance or subsidy be adopted, it is necessary to review afresh the policy hitherto recommended by the Committee. In this connection I would quote the following extract from a previous paper written by me:—

"When it was decided that it was necessary for the Government to help aviation, directly or indirectly, in order to keep it in being, it was agreed that the best assistance that could be given to Civil Aviation would be a certain number of Government landing grounds and accommodation which aerial transport companies could use, free meteorological information, and the assistance of Government wireless on the routes, the marking out of routes, the providing of lighthouses at certain stations, and the inspection and certifying of the airworthiness of machines free of charge, and a certain amount of other minor assistance instead of giving direct subsidies to companies for useful work done, or simply for flying.

"This policy has been carried out and grounds have been bought, sheds provided and routes marked out, but unfortunately it looks as if no aerial companies are likely to use to the full the facilities afforded, as apparently the assistance given has not been sufficient to enable companies to carry out useful work. This is partly due to the fact that the Post Office have not yet been able to give them useful mail contracts. Under these circumstances it seems doubtful policy to continue the expenditure of money on this indirect assistance on the scale previously proposed, when it appears that the assistance will not be utilised. In other words, aerodromes and sheds will be provided and no machines will use them for the purpose for which they were intended."

5. My recommendations are as follows:—

(i) It is not advisable to give direct subsidies to aerial transport companies for work done, nor do I think the necessity has yet been shown for doing so.

(ii) It would be preferable to allot the money suggested for subsidies to design and research by placing more orders for experimental machines with certain approved companies.

(iii) If the subsidy is granted, then I am in agreement with the system of applying the subsidy suggested in the Majority Report in paragraph 8 (r).

H. TRENCHARD.

April 20, 1920.

APPENDIX

Brief Summary of the more Important Steps taken by the Air Ministry for the Assistance of Civil Aviation.

1. *Administrative Organisation.*—The Air Ministry has been in existence since April, 1918. The Department of Civil Aviation was established on April 1, 1919.

2. *Co-ordination of the Meteorological Service under the Air Ministry.* The Headquarters of the Meteorological Office were transferred from South Kensington to the Air Ministry in November, 1919, and all the Government Meteorological Agencies including the Marine, Statistical and Instruments Divisions, and the British Rainfall Organisation, are now co-ordinated under the Department of Civil Aviation which is responsible for the whole Meteorological Service of Great Britain. A new Meteorological Committee has been formed on which the Royal Society, the Admiralty, War Office, the Ministry of Agriculture and Fisheries, the Board of Trade and the Colonial Office continue to be represented.

3. *Research.* The assistance and experience of the Department of Supply and Research which is now under the Air Ministry is at the disposal of civil aviation firms.

An Aeronautical Research Committee has been appointed to assist in the advancement of Aeronautical Science.

4. *Adjustment of International Relations.* The International Air Convention, in which Great Britain took a leading part and on the provisions of which the British Air Navigation Regulations are mainly based, has been signed by the Allied and Associated Powers and the Dominions except the United States, Japan and Canada. The total number of States which have signed is twenty-nine.

Pending ratification of the Convention temporary agreements for communications by air have been concluded with Belgium, France, Italy and Portugal; and also with Holland and Switzerland.

Permission for individual flights has also been obtained from Denmark, Sweden, Norway, Finland and Spain.

5. *Legislation for the Control of Air Navigation in Great Britain.* An Air Navigation Act, 1919, was passed to make temporary provision for the regulation of Air Navigation and provisional Air Navigation Regulations came into force on May 1, 1919, and have been amended where necessary. The regulations provide, *inter alia*, for registration of aircraft, licensing of personnel, issue of certificates of airworthiness, rules for lights and signals and rules of the air, and instructions with regard to arrival of aircraft in and departure from the United Kingdom.

An Air Navigation Bill largely based on the recommendations of the Civil Aerial Transport Committee, will be introduced in the House of Commons this Session, in order to bring the International Air Convention into force.

A Sub-Committee of the Advisory Committee for Aeronautics has issued a report as to load factors to be used in the design of Civil Aircraft.

6. *Uniformity of Air Legislation throughout the Empire and Co-operation between Home, Dominion, and Colonial Governments.* Departments concerned have been notified of the necessity of all Dominion and Colonial legislation conforming to the Convention and as far as possible to the British Air Navigation Regulations.

Close relations are maintained between the Foreign Office, Colonial Office, India Office, and Air Ministry, whereby touch

is kept with all Overseas development in civil aviation. Australia, Canada, and South Africa are represented by liaison officers at the Air Ministry.

A conference was held in September, 1919, with representatives of the Dominion Meteorological Departments.

7. *Survey, etc., of Air Routes.* Considerable assistance has been given in connection with the London-Paris and London-Brussels routes which have been in operation by private enterprise since August, 1919.

The route from Cairo to Cape Town has been surveyed and prepared by the State, and comprises twenty-four landing grounds and nineteen emergency landing grounds. Negotiations are now in progress between the Governments of South Africa and of the Colonies through which the route passes, the Colonial Office and the Treasury as to the future maintenance of these aerodromes.

The route from Cairo to Australia has also been surveyed.

On the Cairo-Karachi route, the recommendations of the Advisory Committee on Civil Aviation have been adopted and are being put into force; wireless and landline facilities have been improved; and the route is being prepared for a mail service.

Route directions, maps, charts and navigational information have been, and are, prepared and distributed to aviators undertaking pioneer flights. A number of aerodromes are available for civil aviation in India, and others are being prepared for this purpose.

The ban on Civil Aviation in India has been removed. The ban has also been removed in Egypt in specific cases.

The site for an aerodrome at Malta has been selected and experiments are being made to ascertain its suitability.

A special section of the Department of Civil Aviation has been formed for the purpose of mapping and marking routes. An aerodrome book is ready for publication.

8. *Efficient ground organisation comprising:—*

- (i) *Provision and organisation of aerodromes.*
- (ii) *Provision of wireless telegraphy and telephony facilities.*
- (iii) *Distribution of meteorological information.*
- (iv) *Distribution of general information.*

Private enterprise has been assisted by the provision of aerodromes, wireless, meteorological facilities and the issue of general information.

(i) The London terminal customs aerodrome at Hounslow was the first of its kind in the world. It has now been transferred to Croydon (Waddon) as Hounslow had to be returned to the War Office.

Lympne aerodrome (near Folkestone) has been established as a customs aerodrome on the coast for the further convenience of international traffic.

A portion of the seaplane station at Felixstowe has been taken over as a civil station for sea aircraft and customs facilities provided for traffic across the North Sea.

Negotiations are in progress with several Municipal Authorities for the establishment of municipal aerodromes near large centres of population in Great Britain.

Where the volume of traffic warrants the establishment of customs facilities at private aerodromes, the Board of Customs have agreed to provide such facilities under certain conditions. Messrs. Handley Page's aerodrome at Cricklewood is the first to have the advantage of this arrangement.

A number of emergency landing grounds have also been

surveyed throughout the British Isles along probable future routes and negotiations are in progress with the owners.

Aerial lighthouses have been put in operation at certain points, and with the development of night flying will be increased in number.

Where civil aerodromes are established, such as at Croydon and Lympne, a Civil Aviation Transport Officer is placed in charge and with a small staff has the duty of maintaining the aerodromes and of assisting those using them.

(ii) Improvements have been made in the Air Ministry Wireless Station, and the terminal aerodrome at Croydon is being equipped with the most up-to-date W.T., radio-telephony, and directional finding apparatus.

The system of communications to the Continent is already providing a useful service, and is being steadily improved.

Arrangements have been made for the transmission and receipt by wireless of meteorological reports to and from neighbouring countries, and the organisation in Great Britain of a network of wireless stations for meteorological work continues.

Five stations in the United Kingdom have been fitted with radio-telephony apparatus. Proposals have been submitted for the institution of a uniform system of wave-lengths throughout the world.

The Air Ministry is represented on the Imperial Communications Committee.

(iii) A system of contributive and distributive meteorological stations has been devised to cover the United Kingdom, and a number of local centres have been established to contribute reports essential for aviation. In connection with the Air Services to the Continent a complete system of British weather reports for S.E. England has been inaugurated.

(iv) General information has been distributed relating to progress abroad, aerial routes, commercial enterprises, etc. Close touch has been maintained with aircraft firms and the Department of Research, and Communiqués and notices have been issued to the Press.

9. *Licences.* Licences have been issued and periodically renewed for pilots, engineers, navigators and aerodromes; and certificates of registration and airworthiness for machines.

10. *Government Enquiry into Accidents.* The investigation of accidents is being carried out by a special section, and powers to make this investigation compulsory are being sought under the Air Navigation Bill.

11. *Establishment of Mail Services.* Since November 10, 1919, an Air Mail Service has been in operation between London and Paris. Tenders for an air mail service between England and Holland have been invited by the Post Office, and negotiations are proceeding for placing a contract for a service between London and Brussels on the lines already reached with Holland.

Discussions between the Air Ministry, the India Office, and the Treasury are still in progress with regard to the incidence of the cost and other details of the proposed Cairo-Karachi Mail Service.

12. *Development of Airships.* The Air Ministry has entered into negotiations with a syndicate for the commercial development of airships.

13. *Disposal of Service Aircraft and Material.* A number of machines have been presented to the Dominions and Colonies and will be available for the development of Civil Aviation in the countries concerned.

Discussing the report, Mr. Holt Thomas said he regarded it as extremely hopeful and significant that such an eminently practical committee had officially recognised that a commercial aeroplane service, even with the imperfect organisation at present existing, can be operated reliably on such a difficult route climatically as that between London and Paris. He added:—

When the London-Paris daily express service was started last August, he ventured the prophecy that at the end of the first year there would be a percentage of reliability of about 80. Today, as a matter of fact, although this first year had not yet been completed, the figure was actually well in excess of 80 per cent. This being so, he was sorry the committee could not take a bolder and more definite course, and recommended in the interests of the public, as well as in those of the airways, that there should be a general transference of first-class mail matter from land and sea to air. Their recommendation should, for instance, in his opinion, and on the definite daily records of the "air express," have been that all first-class mail matter between London and Paris should now be put into the air.

He added: It is perfectly clear that the country cannot afford, today, to spend large sums in subsidies. But suppose

that all first-class mail matter between London and Paris were sent forthwith by air, with the immense saving of time to the business community which would accrue, and suppose that the air transport companies were paid at the rate of 3s. a pound for carrying it, then a surcharge of only a penny a letter over and above the ordinary rate of postage should enable such a service to be put on a perfectly practical basis. There might be an additional 6d. charge, paid at the option of the sender, for the express delivery of a letter by hand when it had reached its destination. Before I started the first London-Paris service I was told that the aeroplane could never be made reliable, and that it could not, therefore, be considered seriously as a carrier of His Majesty's mails. Well, we have already proved, when flying through probably the worst weather in the world, that this argument is unsound, and that you can get a perfectly reasonable percentage of efficiency even while the air way is in its very infancy. This being so, the very broadest conception of the question is now essential. We must make use of the air in the interests of the community at large; and the most immediate and useful way of making 100 miles an hour air transport of direct benefit to the public is by decreeing that mails in bulk shall now be air-borne. This would serve several ends. The

bogey of big-money subsidies would no longer be dangling before the public; business men would only be asked to pay a small and perfectly reasonable extra fee for the acceleration of their correspondence; and the air transport industry, in the regular carriage of such mails, would be provided with the backbone of its existence while it was building up and developing its passenger and goods traffic.

Mr. Handley Page welcomed the report on the principle that there was nothing so bad that something might not be said in its favour. He went on to say: It is distinctly satisfactory that the principle of a State subsidy to the British aircraft industry is at last fully recognised, although much might be urged in favour of a contribution towards a development of home mail services. Considered from the purely military point of view, the attitude of Sir Hugh Trenchard would be perfectly correct if it were a fact that there is no value whatever in commercial aviation, but such is certainly not the case. There is not a merchant in the City, of London who will not readily admit the necessity for

speeding up the communications between all parts of the British Empire if we are to maintain our commercial supremacy, and this can only be ensured by special types of swift passenger and freight-carrying machines.

"The practicability and reliability of the present type of civil passenger and freight-carrying aeroplanes have already been fully demonstrated, and we are on the eve of great improvements in design and capability of commercial aircraft. It is distinctly regrettable that the official Continental aerial mail service should be belittled by the deliberate statement that it has proved to be a failure. It is also unfortunate in the public interests that a Government committee is debarred from referring to the fact that to private enterprise was due its inauguration—in the regular Handley Page service between London and Paris and London and Brussels two months before the Treaty of Peace was signed. It has been running continuously since May 1, 1919, and during that period has carried 6,100 passengers, 100,000 lbs. of freight, and covered over 142,000 miles."

ROYAL AERONAUTICAL SOCIETY NOTICES



Patron.—His Royal Highness the Duke of York, K.G., has graciously consented to become a Patron of the Society.

Honorary Fellows.—The Council have elected Air-Marshal Sir Hugh Trenchard, Chief of the Air Staff, and Commander J. C. Hunsaker, U.S.N. (C.C.), Assistant for Aeronautics to the Chief of the Bureau of Construction and Repair of the U.S. Navy Department, Honorary Fellows of the Society.

The list of those upon whom this distinction has been previously conferred is as follows:—Mr. P. Y. Alexander, Major B. F. S. Baden-Powell, Prof. W. H. Dines, Lieut.-Gen. Sir David Henderson, Maj.-Gen. Sir Frederick Sykes.

Chairman.—Air Commodore H. R. M. Brooke-Popham was, as a result of the Council ballot, declared duly elected Chairman of the Society for the year 1920-1921 at a Council Meeting held on June 15. He will assume office in October next.

Donation.—The Council desire most gratefully to acknowledge the gift of a sum of £50 towards the expenses of the Society from a Member of Council.

Olympia Aero Show.—Arrangements have been made for a reception room for the use of Members to be available

during the Aero Show which is to be held at Olympia from July 9 to 20. Stands numbered 94 and 95 have been allotted for this purpose by the Exhibition Committee, and will be found immediately on the left of the Hammersmith Road entrance. A telephone which may be used free by Members, will be installed (No. Hammersmith 2130). The room will be fitted up as a sitting room, and current numbers of aeronautical papers will be transferred for this period from the Library at 7, Albemarle Street.

Wilbur Wright Dinner.—Through inadvertence the name of Mr. White Smith (Chairman of the S.B.A.C.) was omitted from the list issued last week of those present at the dinner before the Wilbur Wright Lecture. Col. H. T. Tizard was at the last moment prevented from attending.

Technical Terms Committee.—At a meeting of the Technical Terms Committee held on June 18 the resignation of the Chairmanship was accepted with great regret. It was decided to ask Air-Commodore Brooke-Popham to act as Chairman of the Committee *ex-officio* on assuming the Chairmanship of the Society. Wing-Com. Cave-Browne-Cave was elected Vice-Chairman.

W. LOCKWOOD MARSH,

Secretary

7, Albemarle Street, W. 1, June 25, 1920

CORRESPONDENCE

[The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.]

THE SIDE-SLIP LANDING

[2024] I regret that my reply to Mr. Courtney's criticism of my letter is rather late, but I feel bound to reply if only to offer him an apology for causing him so much pain, and to express the hope that my letter caused him less agony than I experienced when I read his article.

To boil down his summary still further:—He says that in order to assist him in judging distance, an air-brake is necessary, and he follows this up by saying, "hence the side-slip." His air-brake is, therefore, nothing but an ordinary side-slip. This being the case, why not refer to it as such, and cut out the term air-brake altogether? We all know what a side-slip is, and an air-brake, as the name implies, is for checking forward speed. An example of the air-brake is the swing-tail landing, carried out after flattening out to land, and it is a very different thing from an ordinary side-slip to assist in reaching a definite mark.

I cannot agree that commercial landing speeds will be quite as much as 100 m.p.h. in the near future. Modern design seems to have a tendency in the opposite direction. Landing speed is too often confused with the speed at which a machine is brought in. Landing speed is actually the speed at which a machine stalls, and one would have to be a very quick thinker to force-land a machine that stalls at 100 m.p.h.

My efforts to picture this machine have reminded me of the remark of a pilot when the "Snipe" first came along. He said, "I used to enjoy myself floating about on 'Pups,' nowadays I feel like a d—d projectile."

June 21.

E. J. D.

NON-INFLAMMABLE DOPE

[2025] You will no doubt have noticed in the *Evening News* of the 16th inst., some particulars of the interesting experiment carried out in the United States in regard to fireproof dope, by which two airmen—Messrs. Kerwood and Campbell—demonstrated that hooded suits painted with dope, the fabric of the aeroplane being similarly treated, could be

rendered proof against the flame set up by spraying them with petrol and igniting them.

No doubt many of our customers, during the early part of the War, will recollect the "stunts" we used to carry out with Titanine, when our representatives used to carry with them a frame on which a burning wax match would be laid or petrol poured and ignited, without setting fire to the fabric of the frame. We explained at the same time that by slightly adapting our schedule, the fabric could be rendered, in every respect, proof against flame.

Similar representations were made to the authorities, who, however, used to say, "Yes, but that would injure the dope skin and cause slackness." They, however, would not lay down a definite standard of tautness, though we suggested that if they would do so we would guarantee to produce an absolutely flameproof dope within any limits they might lay down. We, of course, knew that if they did lay down a standard it would have to be a reasonable one, or some of the dopes they were using would not conform to it.

To revert to the American experiment, we regard the fireproofing of aeroplane wings as an invention of our own, pending any information to the contrary, as we had already succeeded in doing this in 1914, and hold a patent in connection with this dating from 1917. For reasons connected with the War, it was not decided until then to patent the invention. It would be interesting to know how the Americans have been able to accomplish their object without infringing our patent.

If any enterprising pilots would like to make the same attempt here, we should be very pleased to furnish the necessary materials for the experiment, and could guarantee at the same time that the dope is both practical and reasonably durable.

TITANINE LTD.,

T. W. H. WARD,

Managing Director

175, Piccadilly, W. 1, June 23, 1920

AIRISMS FROM THE FOUR WINDS

WITHOUT judging between the adoption of the system of a chain of "All-Red" wireless stations, as recommended by the Imperial Wireless Telegraphy Committee, in their report just issued, and the advisability of giving over to the Marconi Co. or any other body the establishing of such a ring round the world, we welcome the suggestion that Imperial communication by wireless should be firmly founded. Every wireless station created in the world cannot fail to help forward the cause of aircraft. The two great sciences are linked together in their development.

"ONE great weakness is in long-range aircraft, without which it is impossible to strike at the Nationalist centres of resistance in Inner Anatolia. The French here are better provided. Our air force is now exclusively composed of seaplanes, which have done admirable work at Ismid, but which have only a limited radius of action."

In these significant words *The Times* correspondent at Constantinople, under date June 25, comments upon the work of the British forces in the action which it has been found necessary for the Allies to take to enforce respect for the carrying out of the Treaty obligations by Turkey.

ON the other hand, it seems a little superfluous to have "aeroplanes scouting in every direction," as reported from Dublin, in connection with the military search in County Cork for the kidnapped Brigadier-General Lucas. The missing General is hardly likely to be so prominently on view as to justify activity to the extent stated, and it is not very surprising to learn from the same report that "up to this evening no trace had been found of the captured officer." It would appear as if the disposition of our available "air forces" were somewhat misplaced.

In October, 1915, an "item" in connection with a Zeppelin raid was published stating that: "One elderly gentleman, who was in the ground-floor rooms when the bombs exploded, and who was knocked over by the force of the explosion, picked himself up and made his way up the broken staircase to his bedroom on the floor above, and immediately went

to bed, in spite of the fact that the glass of the windows and the shutters behind them in his bedroom had been shattered by the force of this explosion.

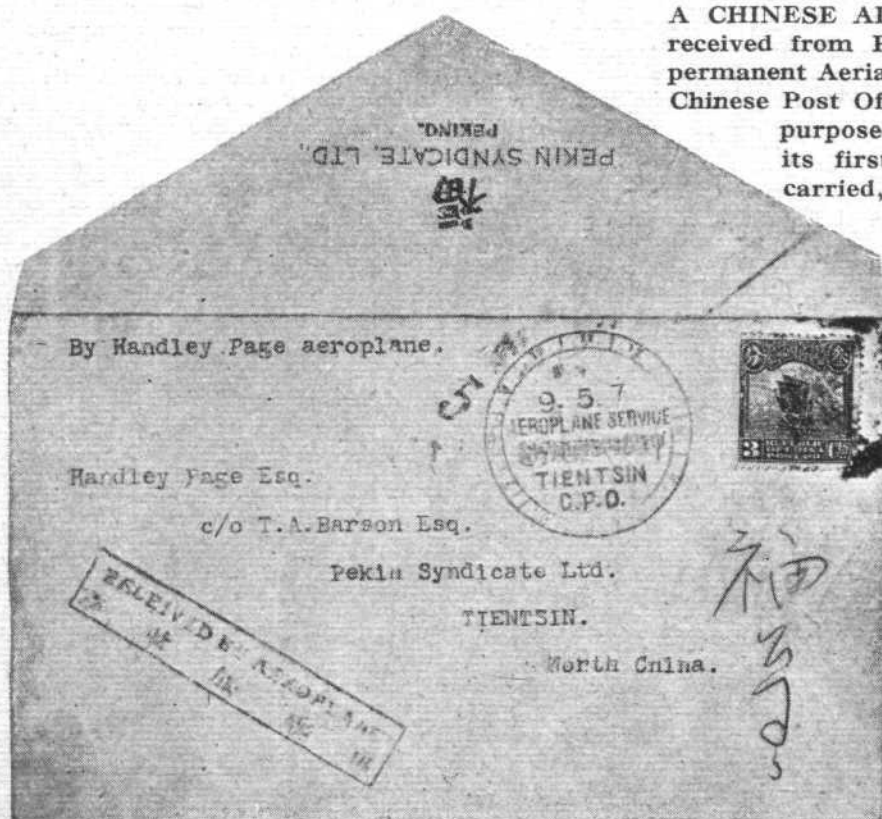
"THE elderly gentleman" was Mr. Thomas Maxwell Witham, the last of the conveyancers under the Bar, and the senior student of Gray's Inn not called to the Bar, whose death is announced this week. This acknowledgment can, now there is no necessity for secrecy to be maintained, be made. Mr. Witham was a real and accomplished sportsman, and his behaviour upon this trying occasion was quite in keeping with the philosophical methods for which he was so well known.

SPORT is synonymous with progress in flying. Last week end extra air expresses were in great demand between London and Paris for the Grand Prix. No less than sixteen buses were necessary to deal with the accommodation demanded. Captain Shepperson was especially distinguished. He accomplished a triple cross-Channel journey for the occasion. After piloting an aeroplane to Paris at 9.45, he returned to Croydon and started on his second trip at 5 p.m., arriving in Paris exactly 1 hour 20 minutes later.

Twelve passengers left the London terminal aerodrome on Sunday morning, and after seeing Comrade's triumph returned to Croydon by air express, arriving between 7.30 and 8 p.m. The total distance covered in these two days was more than 5,000 miles.

So Mary and Douglas when departing from these shores did not after all resort to the only possible method left them for getting about without that publicity which they so strenuously loathe and try to avoid. They announced their intention of travelling to Holland, Belgium, Sweden, Norway and Paris all by way of the air, as naturally nobody could then possibly know they had left London. But, apparently, they changed their programme at the last minute, as they took their departure most prosaically on Monday evening from Liverpool Street by the 8.30 express for Holland. Londoners can now therefore return to their normal occupations once more.

A CHINESE AIR MAIL ENVELOPE: Advice just received from Peking report the inauguration of a permanent Aerial Mail Service in connection with the Chinese Post Office. The aeroplane adopted for this purpose is of the Handley Page type, and on its first journey fifteen passengers were carried, in addition to the mails, between Peking and Tientsin. Among the former were His Majesty's Minister at Peking, the Hon. Mr. Beilby Aston, accompanied by members of the British Legation, General Ching and Mr. Wei, who is looked upon as the keenest Chinese aviator. The aeroplane was piloted by Capt. Mackenzie. For the first time in the history of the Chinese Post Office, letters posted at 5 p.m. in Tientsin reached Peking in time for delivery at 8 p.m. the same day. Stamp collectors will learn with interest that the Chinese Post Office adopted a special postmark for the stamps on mail packets carried on the inauguration of the service. The mark in question, which is seen in our photograph, will not be used again



NAVAL ARCHITECTURE IN AERONAUTICS*

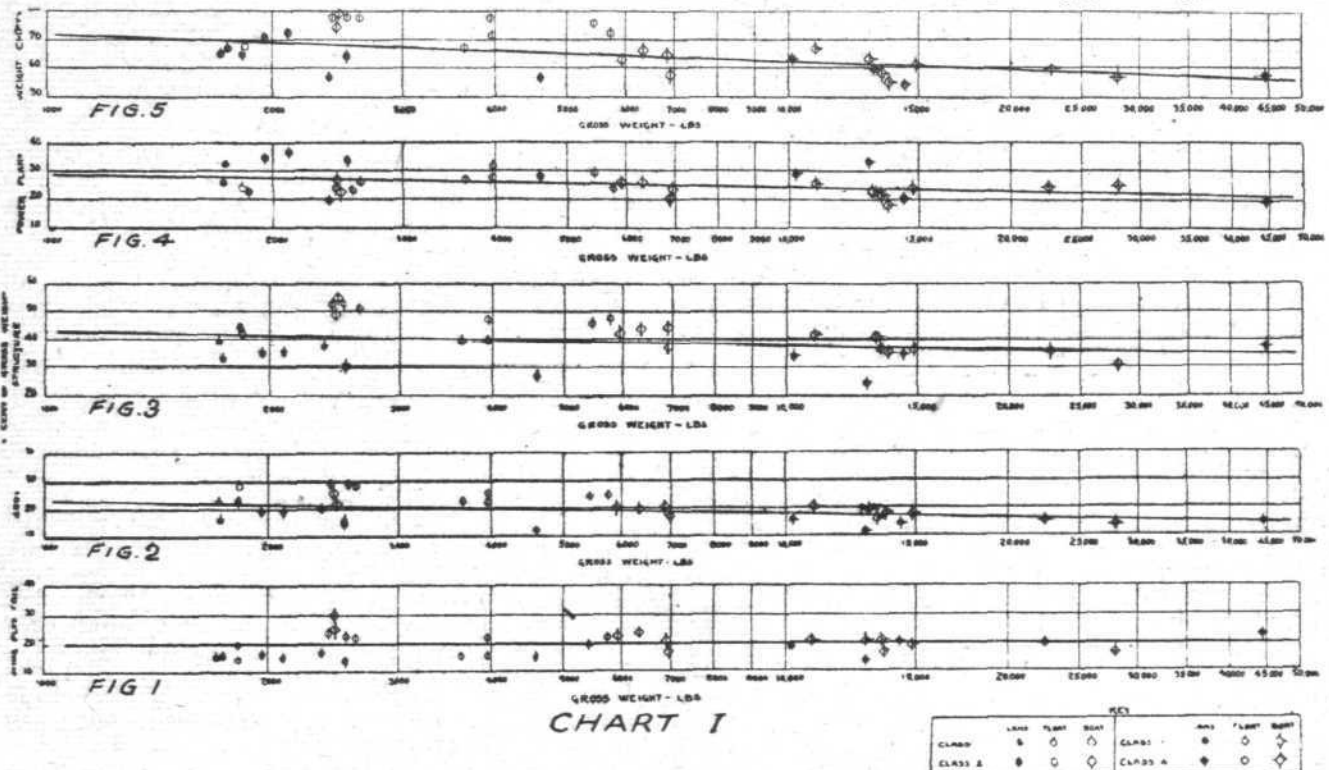
By JEROME C. HUNSAKER, Eng.D., Commander, Construction Corps, U.S. Navy

Introductory.—As an American, I am very pleased to have been asked to read the Wilbur Wright Lecture for this year, and for a moment to stand in the reflected glory of my eminent countryman. Wilbur and Orville Wright were the pioneers who blazed the trail, and made the first clearing in the wilderness. We engineers who follow later are only applying modern machinery and methods of intensive cultivation in their original field. We should, therefore, keep in mind the fact that this field is given to us in trust to keep fertile, that its yield of benefit to mankind shall not diminish.

I have chosen to discuss the use of the tools of the naval architect in aeronautics as I consider that the time has now

of the very problem of animal transport by sea that confronted our naval architects in the Great War. King Hiram of Tyre must have had a very fair naval architect who could fashion ships from cedar of Lebanon with a factor of safety and a range of stability adequate to cope with Atlantic storm waves. Archimedes, however, is generally recognised as the father of naval architecture. He first developed the laws of displacement and buoyancy and is credited with the construction in 264 B.C. of the *Syracusia* of 6,000 tons—a veritable Dreadnought of antiquity.

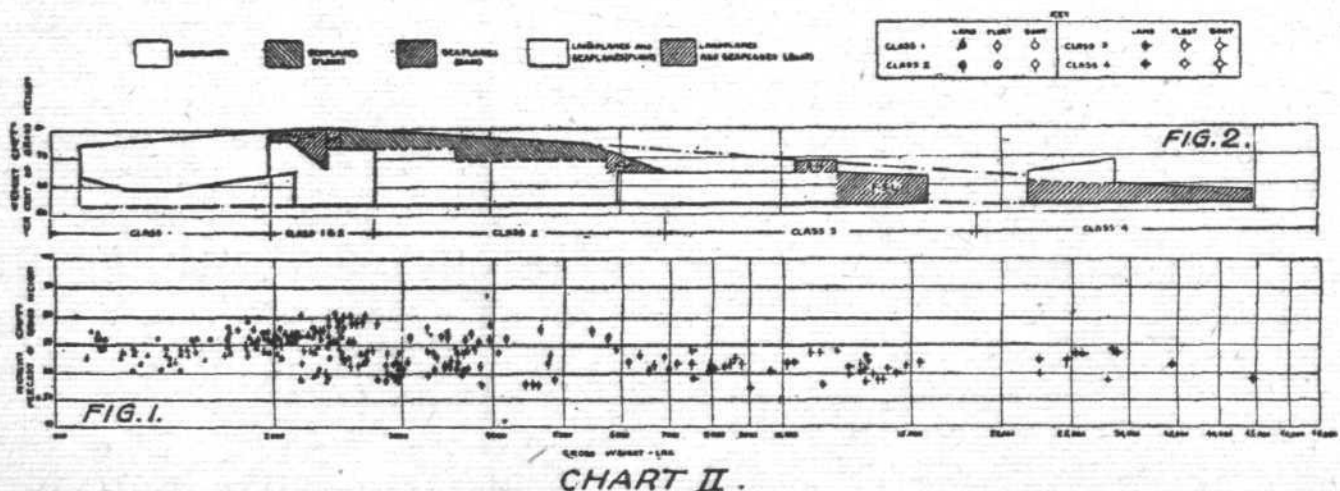
The naval architect practises an art with scientific methods. He applies mathematics, especially geometry, in establishing



come to use them. The naval architect is a craftsman with both artistic and scientific traditions, and the art he practises has a technique perfected by the experience of generations.

It is only a few years since the Wrights gave the aeroplane to the world, but four of those years were years of astonishing activity, and the experience of those years is worth more than that of forty ordinary years. There is already a vast

store of experience available which the naval architect's methods can analyse, classify and reduce to useful engineering terms. While aeronautics as a useful art and a science is new, naval architecture is hoary with age. Noah probably considered and evidently reached a successful solution



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While aeronautics as a useful art and a science is new, naval architecture is hoary with age. Noah probably considered and evidently reached a successful solution

* The annual Wilbur Wright Lecture, at the Central Hall, Westminster, on Tuesday, June 22, 1920.

Factors of safety and coefficients of all kinds used in apparently theoretical or frankly empirical formulæ have been really factors of experience.

The naval architect's problem deals with the sea, and we cannot pretend to know much more of its mysteries than that Syrian landsman who marvelled at the way of a ship in the midst of the sea. The forces of nature are still incalculable, but the design of a vessel to be staunch and safe

is not such a dark and dreadful adventure. Confidence comes from experience and the naval architect's most powerful assistance comes from the scientific analysis of that experience to reduce its lessons to engineering terms.

The naval architect has available a priceless store of learning accumulated by generations of shipbuilders which, with skill and judgment, he can make serve him. He cannot afford to lean too heavily on the past, however, and where a new type of vessel must be produced, imagination and judgment of a high order are necessary. There is an artistic side to naval architecture, and for many craft the artistic feeling or "flair" of the designer distinguishes an advance in the art from a routine product.

In aeronautics I have yet to see a design representing a marked advance in the art made either without this artistic feeling for form and proportion or made wholly without reference to the lessons of the past.

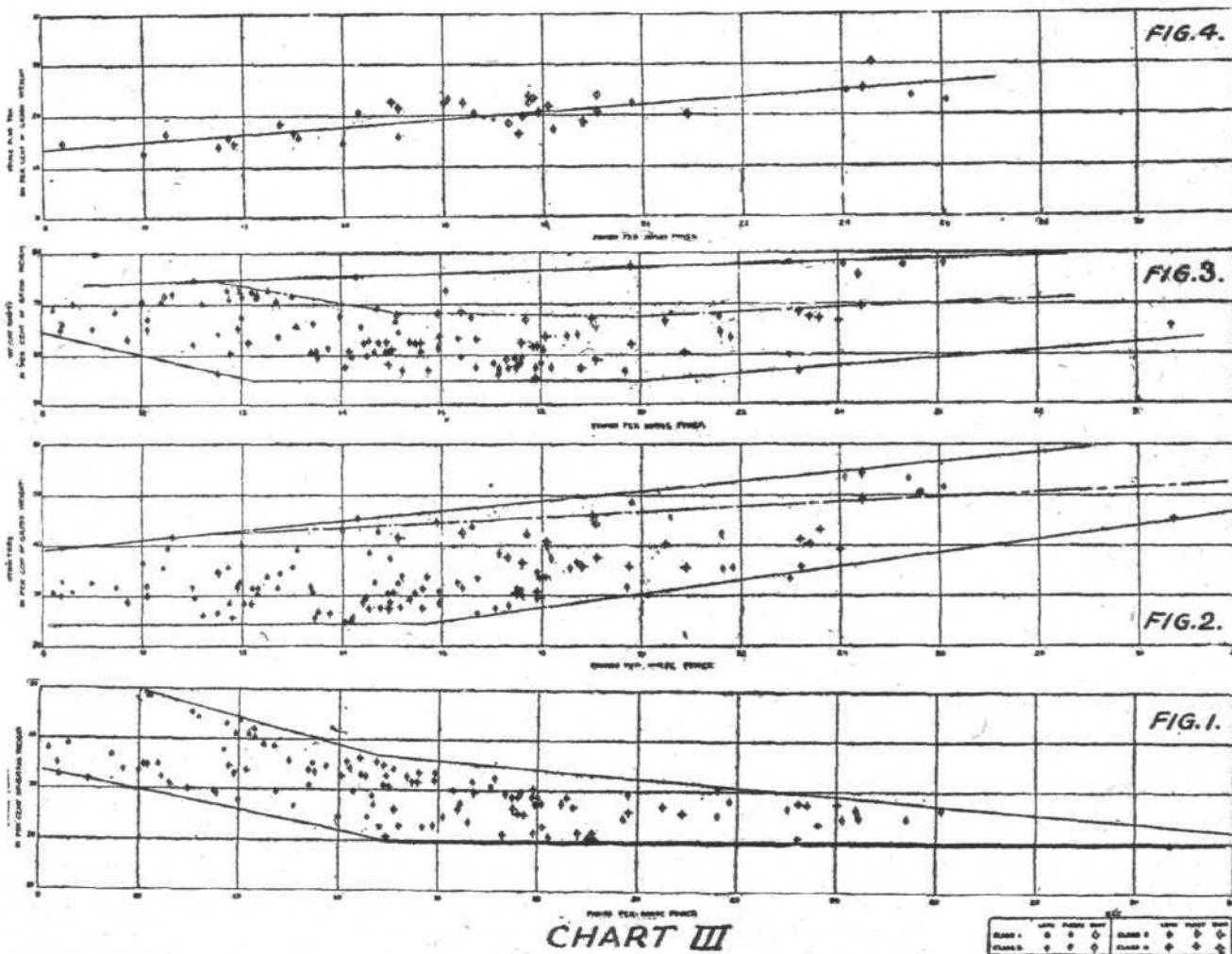
General comparisons are impossible, but it seems to me that in England aircraft designers have followed the naval architect's methods more than in other countries. This is,

out the faults before his patience or purse is exhausted. For large machines and airships the time and expense required are too great for cut-and-try methods. A large flying-boat or an airship is a success or failure on her first flight. If badly overweight, unstable or out of balance there is no chance to rebuild.

In our Navy we look with suspicion on the man who is more concerned with the method of doing things than in the actual doing of them, and to avoid any misunderstanding, I must say here that I wish to make my point as to the utility of the naval architect's methods in aeronautical engineering by attempting actually to do a few of the things which appear to be needed at this time. This work I have thrown into appendices attached to this Paper.

Abstract of Appendix I

Weight Estimation.—Both the aeronautical engineer and the naval architect risk their reputations with weight estimates. A ship must float on her designed water line and an aeroplane must fly with the wing surface provided. Serious over-



perhaps, natural in the first maritime power of the world. In England, also, I find a very extensive application of the results of experimental research, both model and full scale, which really is experience interpreted and analysed by scientific methods.

In France I see less influence of experience and perhaps more originality of invention as shown by occasional radical departures, omitting intermediate steps of development.

In Germany there was once a tendency to "professorial designs" based too strictly on theory, resulting in strange and awkward structures like the Taube types. During the War something happened to reverse this policy, and we saw a series of machines developed step by step, obviously from experience.

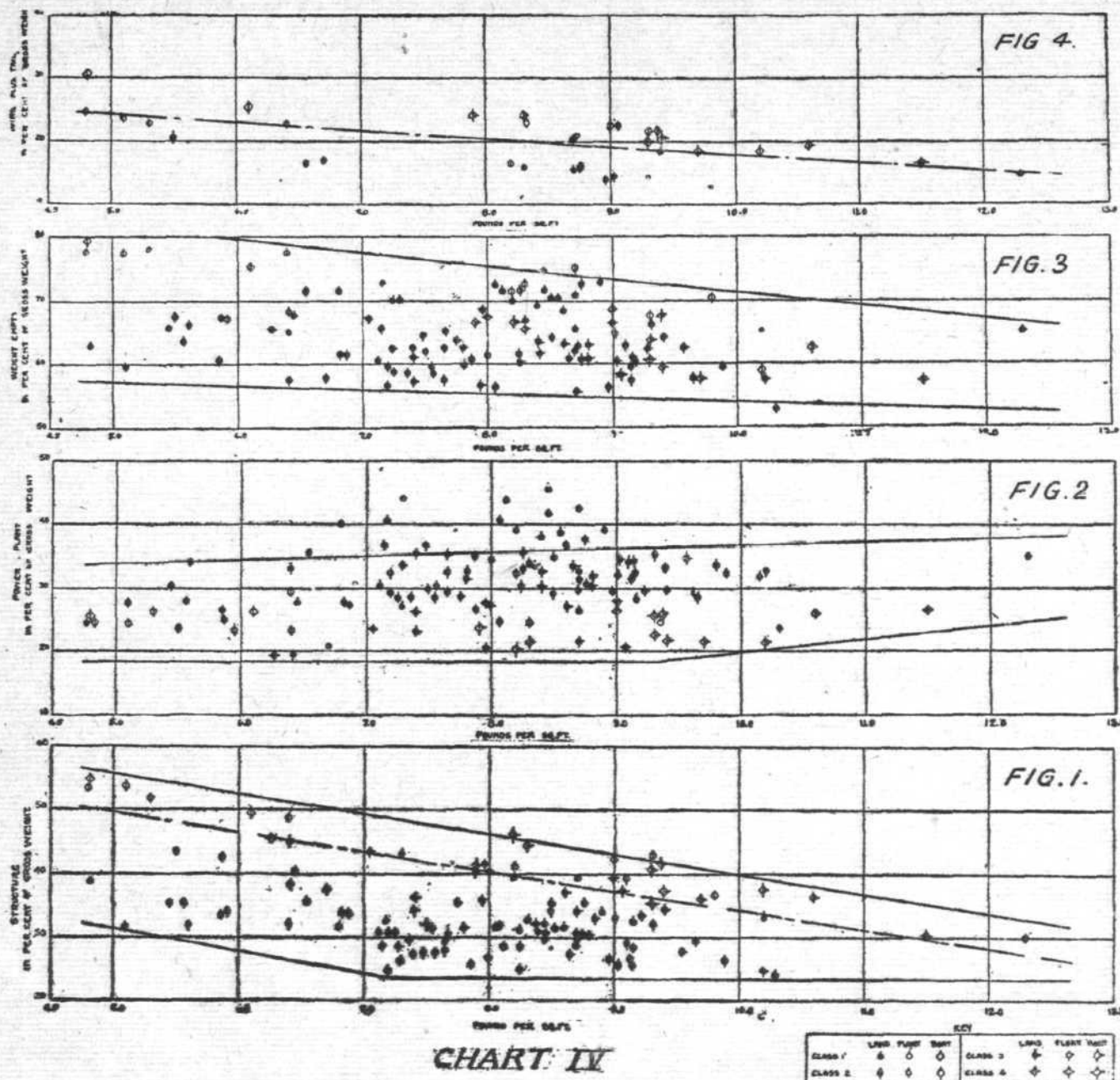
In America we have suffered from the designs of the inventor without experience and from the practical rule-of-thumb man without theoretical landmarks to guide him. On the whole, the successful designs have been produced by men of imagination and judgment applying analysed experience with the best theoretical and engineering information available.

For very small machines the inventor type of designer has been very successful at odd times. He hits on a good solution, and by a process of cut and try eventually works

weight in either case marks a failure. It is only rarely that vessels are discovered to be much overweight, but, unfortunately, overweight has been all too common with aircraft. Naval architects are able to estimate weight with fair precision from unit weights gleaned from past experience and to check this estimate by calculation from the drawings. During construction, weights are controlled by weighing everything that goes aboard the ship. For aircraft, the practice of rigid weight control has not been well established either in the shop or in the drawing office. Very often construction is commenced before the drawings are completed, and during construction changes and alterations are incorporated without reference to their cumulative effect on the weight. A proposed change may be approved on its merit and not with reference to a definite weight allowance.

It is essential that before construction, or even detail design is commenced, a weight estimate should be made in the nature of a weight allowance which shall be treated like a bank balance and on no account to be overdrawn.

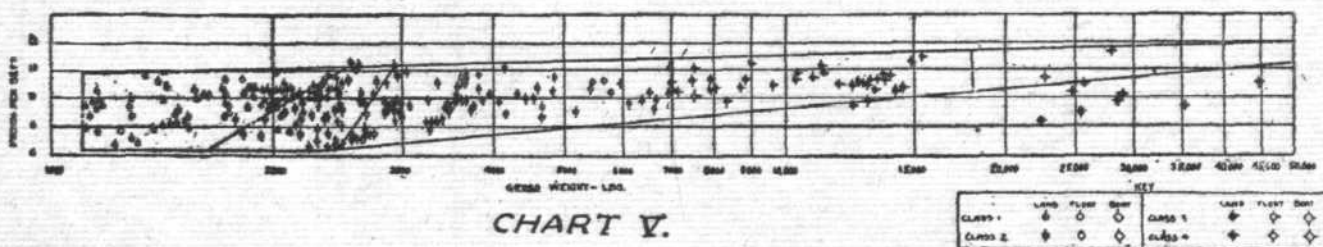
Such a weight allowance must be made from the general design drawings before the details are developed and necessarily is based on past experience with a similar type of construction. This is the naval architect's method, and to avoid guess-work requires extensive records and weight returns from actual work.



The matter of weight estimation for various types of aeroplanes is not really such an inaccurate procedure even in the case of an apparently radical departure from previous types of construction. I have assembled published weight data for several hundred different aeroplanes and seaplanes—British, French, Italian, German and American—from the smallest to the largest, and while the returns in any individual case may be unreliable, the general trend is usually quite definite. It appears that no designer, whether using solid wood, hollow wood or metal, is getting something for nothing,

or otherwise classed as failures. There may, however, remain some types which ought to be eliminated or for which the data is in error. However, the plots give little weight to an individual case and are used to establish the general trend of the averages.

I have burdened the Paper with the entire mass of data as designers may have use for it in some other form, or may wish to examine more closely the credibility of the evidence. Also, this collection of the weights of present-day machines, in a way, marks the state of the art.



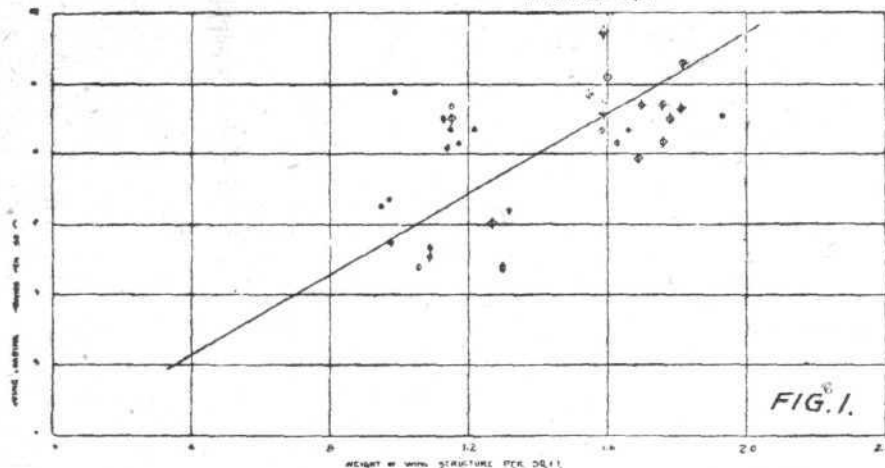
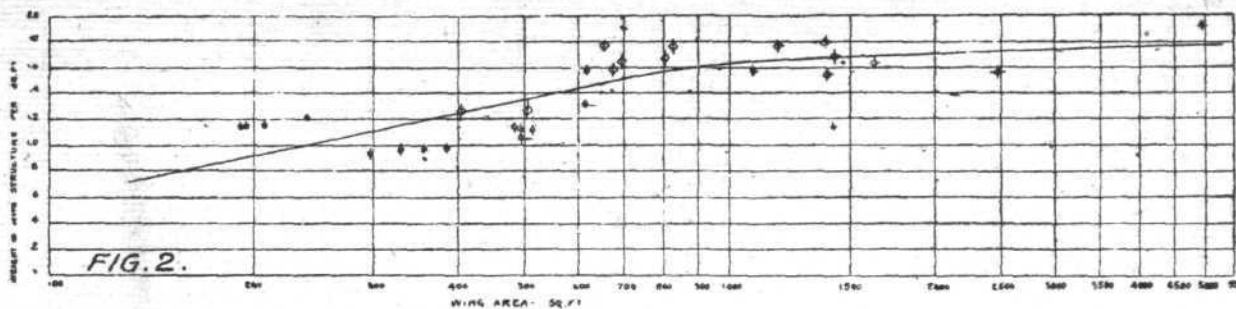
and, in general, the percentage weights for machines of similar type are remarkably alike.

If this conclusion be established, a designer may estimate the weights of a new design with some degree of confidence provided he has data for a somewhat similar type to work from. In the tables of Appendix I, I have given weight data for machines which are supposed to represent successful designs of adequate strength and power, eliminating all that I know to be weak structurally or grossly underpowered,

The data is summarised on charts to furnish a guide for use in preliminary design. The following general conclusions appear to be established:—

(1) The weight of wings, struts, wires and tail surfaces amounts to about 20 per cent. of the gross weight for all types.

(2) The weight of body, fuselage, landing gear, boat hull, etc., trends downward from 22 per cent. of gross for one-ton machines to 15 per cent. of gross for 20-ton machines.



KEY			
CLASS 1	●	○	◇
CLASS 2	●	○	◇
CLASS 3	●	○	◇
CLASS 4	●	○	◇

CHART VI.

(3) The weight of power plant also trends downward from 30 per cent. for small to 20 per cent. for large machines.

(4) The weight light for machines from the smallest to the very maximum sizes has to-day a lower limit at about 53 per cent.

(5) For large flying boats and large aeroplanes the weight light is about the same.

(6) The structural weight is high for low-powered machines and low for high-powered machines, and in general the best weight carriers show about 18 lbs. per horse-power.

(7) Similarly, the structural weight is high for low wing loading and vice versa.

(8) The wing loading is found to be greater for the larger machines, reaching a maximum of nearly 12 lbs. per sq. ft. for the large flying boats.

(9) It appears that all the evidence from past practice indicates that large flying boats can safely be given a higher wing loading and a higher landing speed than land aeroplanes, and, hence, have a distinct advantage as weight carriers for commercial purposes. (To be Continued)

Examination for Aviation Ground Engineers

THE Air Ministry announces:—

Arrangements have been made to hold examinations for candidates desiring to become certified ground engineers (aircraft or engines), under Section 4 of the Air Navigation Directions, 1919, at the following centres during July and August:—

London, July 7, August 4, July 21, August 18; Bristol, July 27; Birmingham, July 28; Manchester, July 29; Leeds, August 24; Newcastle, August 25; Glasgow, August 26.

A candidate may apply to be examined as a Ground Engineer to overhaul and inspect all flying machines and/or engines, or for the examination of any named type or types of flying machine or engine. The examinations which may be partly written, partly oral and partly practical, will be based on the syllabi outlined in Air Ministry *communiqué* No. 499 issued on March 5. Candidates desiring to be examined can obtain application forms from the Secretary, Air Ministry, London, W.C. 2, and should submit their completed forms of applications, accompanied by a fee of 5s., at least seven days prior to the date on which examination is desired. Candidates should also state at which of the above places they wish to be examined.

Aerial Mail Transport in India, etc.

ADVICES just to hand from Calcutta report that the Indian Government is prepared to consider contracts of fifteen years' duration with private firms, for the establishment of effective Aerial Mail Transport Services for India, Burma and Ceylon. Aerodromes are to be erected for the purpose, the main establishment connected with the Royal Flying Corps being situated at Bangalore. As an initial step in the encouragement of Indian aviation, the British Government has recently presented to the Indian Administration 100 aeroplanes of which four are destined for Burma. A certain number are to be placed in the care of the Indian Princes for special employment in their own territories. A native School of Instruction is being established, and the prediction has already been made that a complete Indian Aerial Service will be in existence before the end of 1921. At the present time, Calcutta is the aviation centre for India, and is likely to remain so owing to its geographical position. A Company has already been registered there with a capital of 15,000,000 rupees under the title of Handley Page Indo-Burmese Trans-

port, Ltd., for the purpose of undertaking comparatively short passenger and freight services pending the establishment of permanent long distance services to suit the commercial needs of the country. An aeroplane works, a school of instruction, and an hotel form part of the objects of the Company.

To Our Readers

As we continually receive complaints from readers that they experience difficulty in obtaining their copy of *FLIGHT* promptly each week, we draw their attention to the subscription form which is printed on page iii of the current issue. If this is sent, accompanied by the appropriate remittance, to the publishing offices, 36, Great Queen Street, W.C., it will ensure *FLIGHT* being received regularly each week upon the day of publication.

Art and the Air

AN exhibition of aircraft paintings, by Mr. Geoffrey Watson, is to be held at the Brook Street Art Gallery, 14, Brook Street, New Bond Street, for two weeks from July 7. The exhibition, which is under the patronage of H.R.H. the Duke of York, K.G., and in aid of the R.A.F. Memorial Fund, to which the whole of the proceeds will be given, will be opened informally on the 7th by the Right Hon. Lord Hugh Cecil, M.P. (Chairman of the Memorial Fund), at 12 noon. The pictures number about fifty, and for the main part depict incidents of the air war, but a number of peace aviation pictures will also be shown. Admission to the Gallery will be 1s. 3d., and the Exhibition will be open daily from 10 a.m. to 6 p.m., and on Saturday from 10 a.m. to 1 p.m., until July 21.

Aerial Services in Brazil

Now that the Brazilian Government has definitely signed a contract with the Handley Page Co., no doubt the services will soon start. The first stage will be from Rio de Janeiro to San Paulo, the first step to linking up by air with Buenos Aires and ultimately with every city of any importance in Brazil, Uruguay and Argentina. At Rio, the headquarters will be on the Ilha do Governador, where there will be a flying-school. From San Paulo, will be extended to Florianopolis, Porto Alegre, Pelotas, Montevideo and so to Buenos Aires. It is anticipated that the journey from Rio to Buenos Aires will take 20 hours against the 6 to 8 days now required by steamer.

BOOK REVIEWS

"EASTERN NIGHTS AND FLIGHTS"

"CONTACT" has fulfilled his promise, made in "An Airman's Outings," to give us another volume, but instead of a few months, which it was hoped would represent the interval between the two books, a few years have slipped by. The book is a vastly different one to what it was intended to be, there being very little in it about flying. At the same time the book is a most interesting one, and it makes a timely appearance, for during the six months he spent as a prisoner-of-war, in Turkish hands Capt. Alan Bott saw a very great deal of the Turk and his work. Those who talk so calmly about the trouble in Turkey would therefore do well to study "Eastern Nights and Flights."

As we have said, the "Flights" portion of the book is meagre, and includes only two word-pictures, one telling how "Contact" was shot down near Nazareth and the other giving a very vivid impression of a flight to Damascus from Ramleh after Capt. Bott had escaped, and in both he is at his best. There is another reference to aeroplanes which one reads with relish, as it explains why the German flying service was not able to do its utmost on the Palestine front. In the course of his wanderings from prison to prison, Capt. Bott came across a party of Tommies—survivors of Kut-el-Amara—who were employed by the Germans on the Anatolian railway, and among the things they handled were the Hun aeroplanes. They handled them very well. "Besides ripping open the fuselage fabric and cutting through some of the longerons, the Tommies had hacked at struts and clipped various bracing wires. They had prised open the wooden cases, and before replacing the covers, had snapped spars, bent elevators and rudders, and been generally unpleasant to the planes. This kind of wrecking was likewise being done, in greater or lesser degree, at Belamedik and other points on

the railway where prisoners were forced to work." No wonder when we entered the Turco-German headquarters we found a copy of a letter from the O.C. German flying corps to Air Headquarters in Germany, complaining bitterly about "the bad packing and the bad handling in transit of aeroplanes sent to Palestine."

The book is published by Messrs. Blackwood and Sons, at 7s. 6d. net.

AN INTERNATIONAL DICTIONARY

IN view of the increasing use being made of aircraft for visits to the Continent it becomes almost a necessity for the pilot to include an International Dictionary in his kit. While it is desirable that it should comprise several languages, the bulk must be kept down to the minimum. It is for these reasons that the Airman's International Dictionary should meet with a ready welcome. Its size, only 6 ins. by 4 ins. by 1 in., enables it to be slipped in the pocket or an odd corner of the fuselage, and yet it contains a very extensive list of terms used in connection with airships and aeroplanes—with their equivalents in Italian, French and German—to enable a flying man to make his needs and desires known wherever he may land in any of those three countries. In the first part of the book the terms are arranged in order of subjects, while in the second part there is an alphabetical index of all the terms, so reference is a very simple matter. This, as a matter of fact, is one of the most useful features of the book, and distinguishes it from the bulk of the other "handy" dictionaries of this type. The work was originally drawn up by Engineer-Lieut. Mario Mele Dander, of the Royal Italian Flying Corps, and Messrs. Charles Griffin and Co., Ltd., realising its usefulness, at once put in hand an edition for England. The book is strongly bound in serviceable blue cloth, and is priced at 6s.

The Duration Record

THE Commission Sportive Aéronautique of the French Aero Club has now homologated the speed, duration and distance records of the Farman Goliath piloted by Lucien Bossoutrot and Jean Bernard on June 4, 1920. The exact figures are: Duration 24 h. 19 m. 7 s., distance 1,915 kiloms. 200 metres; speed 1,000 kiloms. in 10 h. 19 m. 66 s.; 1,500 kiloms. in 16 h. 42 m. 8 s.

From London to Norway

ON June 25 Major Tryggve Gran repeated his flight across the North Sea. It may be recalled that he flew from Scotland to Norway in 1914, but last week he flew from London to Christiania, via Skagen. His flying time for the 750 miles from London to Christiania was 9 hours. He intends to make a flying circuit of Europe.

High Flight with a Lady

ON a new type 70 Farman biplane on June 22, M. Bossoutrot, took a passenger—Mme. Louise-Faure Favier—to a height of 6,500 metres. The ascent was made in 36 mins.

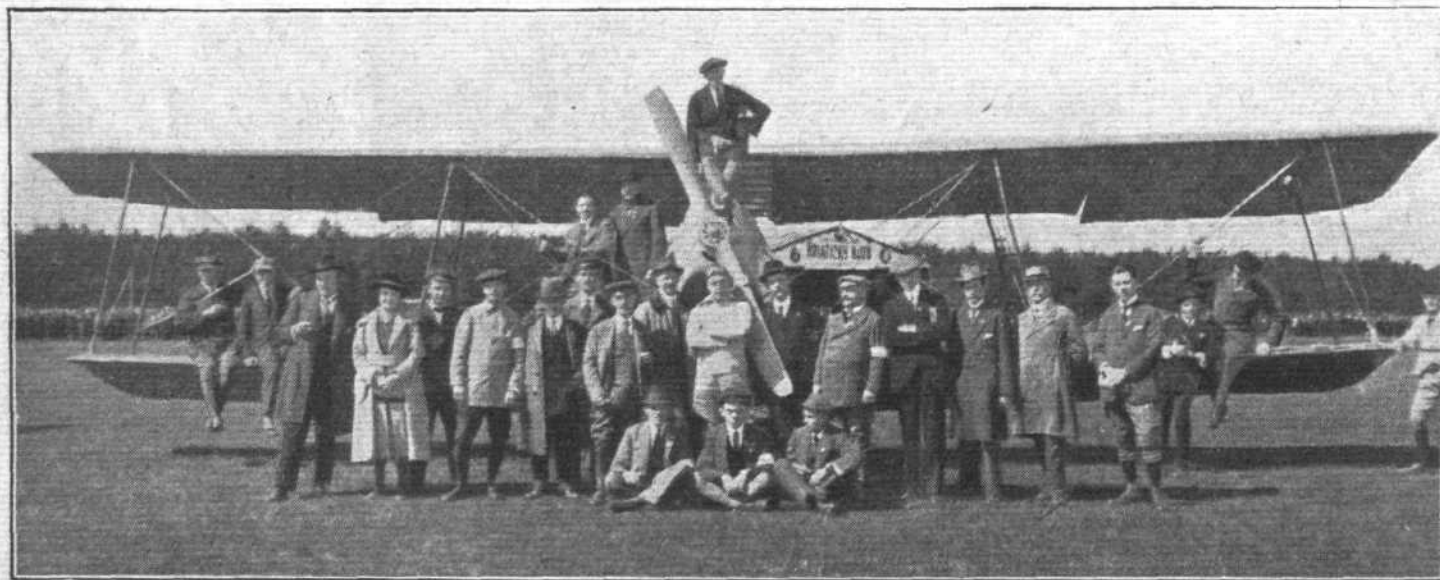
and the descent in 22 mins. The temperature on the ground at the start—11 a.m.—was 20 deg. C., while at 6,500 metres it was 13 deg. C. below zero. The performance is claimed as a record.

Lieut. Roget's Tour of Europe

CONTINUING his tour of Europe Lieut. Roget on June 22 left Warsaw and later in the day arrived at Lemberg after a stormy flight. His next stage will be to Budapest.

France to Algeria and Back

WITH the object of obtaining information for the Compagnie Transaérienne as to the possibilities of an aerial service, Sadi Lecointe on one of the Nieuport seaplanes which took part in the Monaco meeting, has just carried out a long trip round Tunisia and Algeria, accompanied by Capt. Coli as navigator and his mechanic, Duval. The route was from St. Raphael, via Monaco, Ajaccio, Bizerta, Tunis, Susa, Bizerta, Algiers, Alicante, Barcelona, Certe and back to St. Raphael, the distance aggregating 3,600 kiloms. (2,200 miles). During the trip, the machine carried a weight of 650 lbs., representing a load of goods.



The first Aero Meeting in Czecho-Slovakia was held at Bory, near Plzeň (Pilsen) on May 1 and 2 last, five aeroplanes taking part. The above photograph shows Members of the Committee of the Aero Club of Western Bohemia. Standing in the centre is Mr. Russ, the Club's "stunt" pilot

Married

Capt. IAN McLAREN, R.A.F., of the Inter-Allied Aeronautical Commission of Control, Berlin, was married on Thursday, June 24, at the British Garrison Church, Cologne, to SIDNEY MARY, eldest daughter of Mr. and Mrs. THOMAS MARLOWE, Longmead, Champion Hill, S.E.

Flt.-Lieut. ARTHUR HICKS PECK, D.S.O., M.C., only son of the late Col. F. S. Peck, I.M.S., and of Mrs. Peck, of Paignton, was married on June 17, at St. Paul's Church, Clifton, to MARJORIE AMY, only daughter of Mr. and Mrs. CLARE SMITH, of Clifton, Bristol.

Capt. S. TREVOR RAVENSCROFT (late Lancs. Hussars and R.A.F.), third son of Samuel Ravenscroft, of Brathay, Oxton, Cheshire, and Broughton Grange, Cartmel, Lancashire, was married on June 9 at the Chapel Royal, Savoy, to MARJORIE, youngest daughter of the late HENRY and Mrs. JENKS, of Barrow Hedges, Carshalton, Surrey, and Dunairds, Birnam, Perthshire.

MALCOLM VYVYAN, M.C., late Capt. R.A.F., youngest son of Capt. H. N. Vyvyan, of Ennis Vean, Penarth, was married on June 23 at Milngavie Parish Church, to FAIRY, youngest daughter of Col. JOHN BIRRELL, Allander House, Milngavie.

To be Married

The engagement is announced between Flying Officer LANCE HAROLD BROWNING, M.C., R.A.F. (late Royal Artillery), only son of Mr. and Mrs. B. P. Browning, of Rose Hill School, Banstead, and NANCY WOOLLRIGHT, fourth daughter of the late HOWARD W. TROLLOPE and Mrs. HOWARD TROLLOPE, of Banstead, Surrey.

The engagement is announced of SAMUEL LAURENCE CANNON, R.A.F., elder son of Mr. and Mrs. Samuel Cannon,

Hitchin, Herts, and JOAN MARY IRELAND, only child of Mr. and Mrs. E. R. IRELAND BLACKBURN, East Looe House, Canford Cliffs, Dorset (late Weald Manor, Bampton, Oxfordshire).

The engagement is announced between Capt. C. LAURENCE, late R.A.F., youngest son of Mr. and Mrs. F. Laurence, of Half Yoke, Maidstone, and Lady SYBIL STOPFORD, eldest daughter of the Earl of Courtown.

The marriage arranged between Capt. JOHN LEAM MIDDLETON, D.F.C., and Miss ALICE MARGARET SHORT, will take place on Tuesday, July 20, at 1 p.m., at the parish church of St. Mary and All Saints, Chesterfield.

A marriage has been arranged, and will shortly take place, between Lord MONTAGU OF BEAULIEU, and PEARL, daughter of the late Major B. CRAKE (Rifle Brigade) and Mrs. BARRINGTON-CRAKE, of 29, South Street, Thurloe Square, S.W.

The engagement is announced between Maj. OLIVER STANLEY, younger son of Lord and Lady Derby, and Lady MAUREEN STEWART, eldest daughter of Lord and Lady Londonderry.

Items

The will of Mr. SANDERSON BLAIR, of Charlotte Square, Edinburgh, and of Wroughton Cottage, Wroughton, Wilts, the well-known gentleman cross-country rider, and who during the war was a lieutenant in the R.F.C., has been proved at £11,676.

The will of Maj. REGINALD DAVID DE LA COUR CORBETT (48th Pioneers, Indian Army, attached R.F.C.), of Goldington Road, Bedford, who saw service in the South African War, and who died a prisoner from privations endured during the siege of Kut, and afterwards as a prisoner at Changri, Asia Minor, has been proved at £1,808.

For the Civil Service

In the list of candidates selected from the forces by a special Board, under authority from the Civil Service Commissioners on May 18, appears the names of Capt. H. N. Lett, D.F.C., for the Indian Civil Service, and Capt. E. A. Simson, A.F.C., for the Home Civil Service, Class I.

The Triple Fatality at Peterborough

WHILE flying at a height of 600 feet at Warrington, near Peterborough, on June 24, an Avro, piloted by Mr. D. H. Sadler and carrying two passengers, Mr. C. Guest and Mr. P. Runquest, suddenly crashed to the ground; the three occupants being killed. At the inquest, evidence was given that the machine had been tested by certificated ground engineers just before the last flight. A witness said that when the machine was returning, it did a few turns,

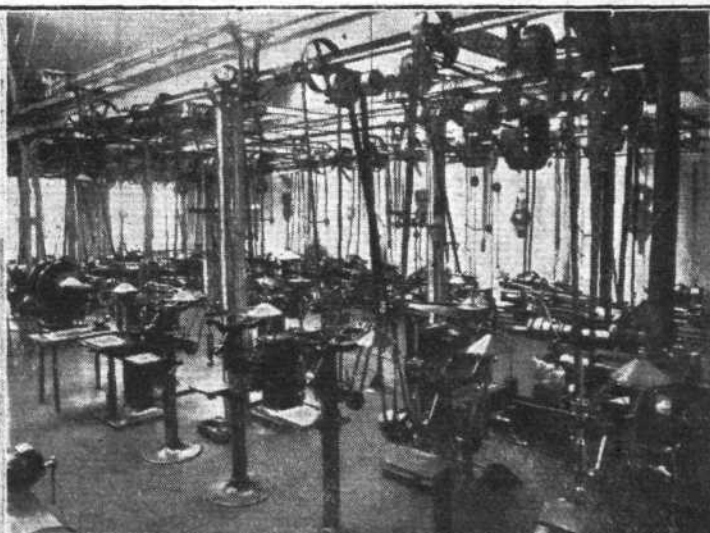
then there was a loud report and the planes broke away from the fuselage; there was no looping on that flight.

A representative of the Air Ministry said it appeared to him that the matter was a pure accident, and there was no evidence of the cause.

The Coroner found a verdict of "accidental death," and said that a careful technical investigation would be made by the Ministry later.

M.C. Award Cancelled

It was announced on June 23 that the King has directed that the award of the Military Cross to Temporary Capt. James Arthur Dermot Dempsey, Royal Irish Fusiliers (formerly R.F.C.), which was gazetted on January 1, 1918, shall be cancelled and his name erased from the Register in consequence of his having been removed from the Army.



Two views in the works at Putney where so many Bloctube carburettors were turned out during the War. On the left a corner of the fitting shop, and on the right a view of the machine-tool shop

THE ROYAL AIR FORCE

London Gazette, June 22

Permanent Commissions

Flight Lieut. F. E. J. Coates is granted a permanent commn. as Flight Lieut. (T.); June 8. Flight Officer A. H. G. Dunkerley (A.) resigns his commn.; May 27 (substituted for *Gazette* of May 11).
The initials of Flight Lieut. J. G. P. B. Angell (T.) and Maj. J. R. W. Smyth-Pigott, D.S.O. (A.) are as now described, and not as stated in the *Gazette* of Aug. 1, 1919.

Flying Branch

Pilot Officer R. T. Wickham to be Flying Officer; May 22. Pilot Officer H. H. Hand, M.M., to be Observer Officer; April 15.
(Then follow the names of 16 officers who are transfd. to the Unemployed List under various dates.)

Lieut. A. Ellis is placed on the Retired List; June 23.

The following Sec. Lieuts. relinquish their commns. on account of ill-health contracted on active service, and are permitted to retain their rank:—J. R. Hodgson; June 16. J. I. Morgan; June 18.

Administrative Branch

Pilot Officers to be Flying Officers.—J. N. Dillon; Jan. 20 (notification in *Gazette* of May 30, 1919, to stand). T. Gregory; Feb. 4 (since demobilised), T. Scott; April 21. J. A. Plunkett; April 23.

Capt. F. Smith (Lieut., R.N.V.R.) relinquishes his temp. R.A.F. commn. on return to Naval duty; Sept. 24, 1918 (substituted for *Gazette* of April 27).
(Then follow the names of 5 officers who are transfd. to the Unemployed List under various dates.)

Technical Branch

Lieut. R. H. Tweedy to be actg. Capt. whilst employed as Capt., Grade (A.); from March 1, 1919, to April 30, 1919. Lieut. R. H. Tweedy is graded for purposes of pay and allowances as Capt. whilst employed as Capt., Grade (A.); from May 1, 1919, to Oct. 23, 1919. Lieut. (actg. Capt.) A. E. Rampton relinquishes actg. rank of Capt. on ceasing to be employed as Capt., Grade (B.); Dec. 28, 1918.

Flying Officer G. C. Wilson to be Flying Officer, Grade (B.), from (Ad.); Feb. 4. Pilot Officer L. Freeborn, M.B.E., to be Flying Officer, Grade (A.); Oct. 1, 1919.

Pilot Officers to be Flying Officers, Grade (B.).—J. C. Barbara (since demobilised), T. A. Dimon (since demobilised), C. E. Kitchenside (since demobilised); Oct. 1, 1919.

Pilot Officers to be Flying Officers.—D. M. Rees, M.B.E., J. Sutherland, M.B.E.; Oct. 1, 1919. R. S. Broderick; April 10. A. W. Edwards; May 21.

Sec. Lieuts. to be Lieuts. without pay and allowances of that rank.—(Hon. Lieut.) J. H. Taylor (since demobilised); April 2, 1918. H. A. Dinnage (since granted short Service commn.); March 24, 1919. W. C. Ibbott; May 23, 1919. J. A. Wilson (since demobilised); June 18, 1919.

Pilot Officer H. R. Powell to be flying Officer, without pay and allowances of that rank; April 22 (since demobilised).

(Then follow the names of officers who are transfd. to the Unemployed List under various dates.)

Lieut. W. C. Hayward, D.C.M. (Sec. Lieut. General List), relinquishes his temp. R.A.F. commn. on retirement from the Army, and is permitted to retain rank of Lieut.; June 23.

Medical Branch

One officer transfd. to the Unemployed List.

Memoranda

(Then follow the names of 2 Overseas Cadets granted temp. commns. and 14 Cadets granted hon. commns. as Sec. Lieuts.)

The following Sec. Lieuts. relinquish their commns., with permission to retain their rank:—S. N. Linsell; March 14, 1919. A. L. Richards; March 19, 1919.

Maj. (actg. Lieut.-Col.) S. S. Kennedy, O.B.E., relinquishes his commn. and is permitted to retain rank of Lieut.-Col.; March 15, 1919 (substituted for notification in *Gazette* of June 4).

London Gazette, June 25

Permanent Commissions

Stores Branch

Flight Lieut. F. E. J. Coates is granted a permanent commn. in the rank stated, with effect from June 8 (substituted for notification of June 22).

Resecoding

Flying Officer A. Dix-Lewis (A.) (Lieut., Middx. R.) is granted a temp. commn. on resecoding, with effect from June 14.

Flying Branch

Lieut. C. C. Villa to be actg. Capt. while employed as Capt. (A.), from Dec. 1, 1918, to March 20, 1919. Flying Officer W. F. Mayoss relinquishes the grading for pay and allowances as Flight Lieut. on ceasing to be employed as Flight Lieut. (A.); Feb. 13.

(Then follow the names of 9 officers who are transfd. to the Unemployed list under various dates.)

Lieut. C. Evans relinquishes his commn. on retirement from the Army, and is permitted to retain his rank; Feb. 26, 1919 (substituted for notification of April 4, 1919).

Administrative Branch

Flying Officer (Hon. Flight Lieut.) R. T. H. Watson relinquishes the grading for pay and allowances as Flight Lieut. on ceasing to be employed as Flight Lieut.; April 8. Sec. Lieut. H. R. Boasten (late General List, R.F.C., on prob.) is confirmed in rank as Sec. Lieut.; Jan. 23, 1919.

(Then follow the names of 3 officers who are transfd. to the Unemployed List.)

Lieut. (Hon. Capt.) R. Kane is placed on the Retired List, and is granted the rank of Capt.; June 26.

Technical Branch

Capt. E. V. King-Hall to be actg. Maj. whilst employed as Maj., Grade (A.); from Oct. 2, 1918, to March 31, 1919. Lieut. (Hon. Capt.) C. L. Hardy to be actg. Maj. whilst employed as Maj.; from April 1, 1918, to July 21, 1918 (substituted for notification of March 12 and April 9). Lieut. T. Kerr-Jones to be actg. Capt. whilst employed as Capt., Grade (A.); from April 4, 1919, to April 30, 1919 (substituted for notification of July 15, 1919). Sec. Lieut. W. Gill relinquishes the grading for pay and allowances as Lieut. on ceasing to be employed as Lieut., Grade (A.); June 22, 1919.

(Then follow the names of 11 officers who are transfd. to the Unemployed List under various dates.)

The notification of Jan. 21, 1919, concerning Lieut. G. M. Roberts is cancelled. The notification of June 8 concerning Lieut. C. Littlejohn is cancelled.

Memoranda

(Then follow the names of 3 Cadets granted hon. commns. as Sec. Lieuts.) Wing Comdr. R. E. M. Russell, C.B.E., D.S.O. (Maj., (actg. Lieut.-Col.), R.E.), relinquishes his temp. R.A.F. commn. on return to Army duty; May 21.

Four officers transfd. to the Unemployed List.

Sec. Lieut. R. E. Parker relinquishes his commn., and is permitted to retain his rank; March 28, 1919.

A British Mission in Argentina

A CIVILIAN aviation mission, composed of the English Capt. Wilmot, Clowes and Bremner, is about to commence a short course of instruction at the Military Aeronautical School at Palermo, in Argentina.

Two More Aerodromes for Canada

Two Canadian aerodromes, at Alberta and Calgary respectively, are to be established for instruction and Government work.

Air Mails in the U.S.

INTERVIEWED recently at San Antonio (Texas), Mr. Otto Praeger, the Second Assistant Postmaster-General, predicted that mail aeroplanes would be travelling between New York and San Francisco by next autumn. Mr. Praeger went on to point out that by the air service the time it takes a letter to cross the continent would be reduced by more than half. Fifty specially constructed aeroplanes will be used in the trans-Continental service, with four or five reserve machines for every machine in service. No attempt will be made to fly at night.

A U.S. Trench Strafer

TRIALS have recently been carried out at McCook Field, Dayton, O., with an armoured triplane, designed and built by the Engineering Division of the Air Service. The triplane is fitted with two Liberty engines, and both engine and fuselage are completely armoured. The armament consists of 8 machine guns and a 37 mm. cannon.

A Family 'Bus

WHAT is believed to be the largest civilian-owned passenger flying-boat in the United States on her maiden

flight of 45 miles recently at Keyport (N.J.), carried eighteen passengers, including Governor Edwards, of New Jersey.

A Curtiss Factory Stops Aviation Work

CLAIMED to be the largest aircraft factory in the United States, the Buffalo factory of the Curtiss Aeroplane and Motor Corporation is to be diverted from aeroplane and motor construction to other work. It is announced that this is "the direct result of the failure of Congress to protect the aeroplane market of the United States against the invasion of British aeroplanes, bought by a syndicate from the British Government at 1 per cent. of their cost, for export to this country and now about to be dumped into this market." The Garden City factory will continue to produce Curtiss aeroplanes and motors.

Bad for the Balloon

AN exciting time befell the two occupants of the basket of an Italian military balloon on June 23. From a message to hand from Rome, it appears that the balloon was caught by a cloudburst and collapsed at a great height. The two pilots had narrow escapes.

Overcome by Sunstroke

FROM particulars reported by the *Daily Mail* correspondent at Bangkok, it appears that two French aviators, flying from Battambang (or Patabang, 180 miles E. by S. of Bangkok) towards Bangkok, the capital of Siam, were forced to descend in Central Siam. They walked for five hours, seeking assistance. One man collapsed and died of sunstroke.



All communications to be addressed to the Model Editor. A stamp should be enclosed for a postal reply.

A Compressed-Air-Driven Model—continued.

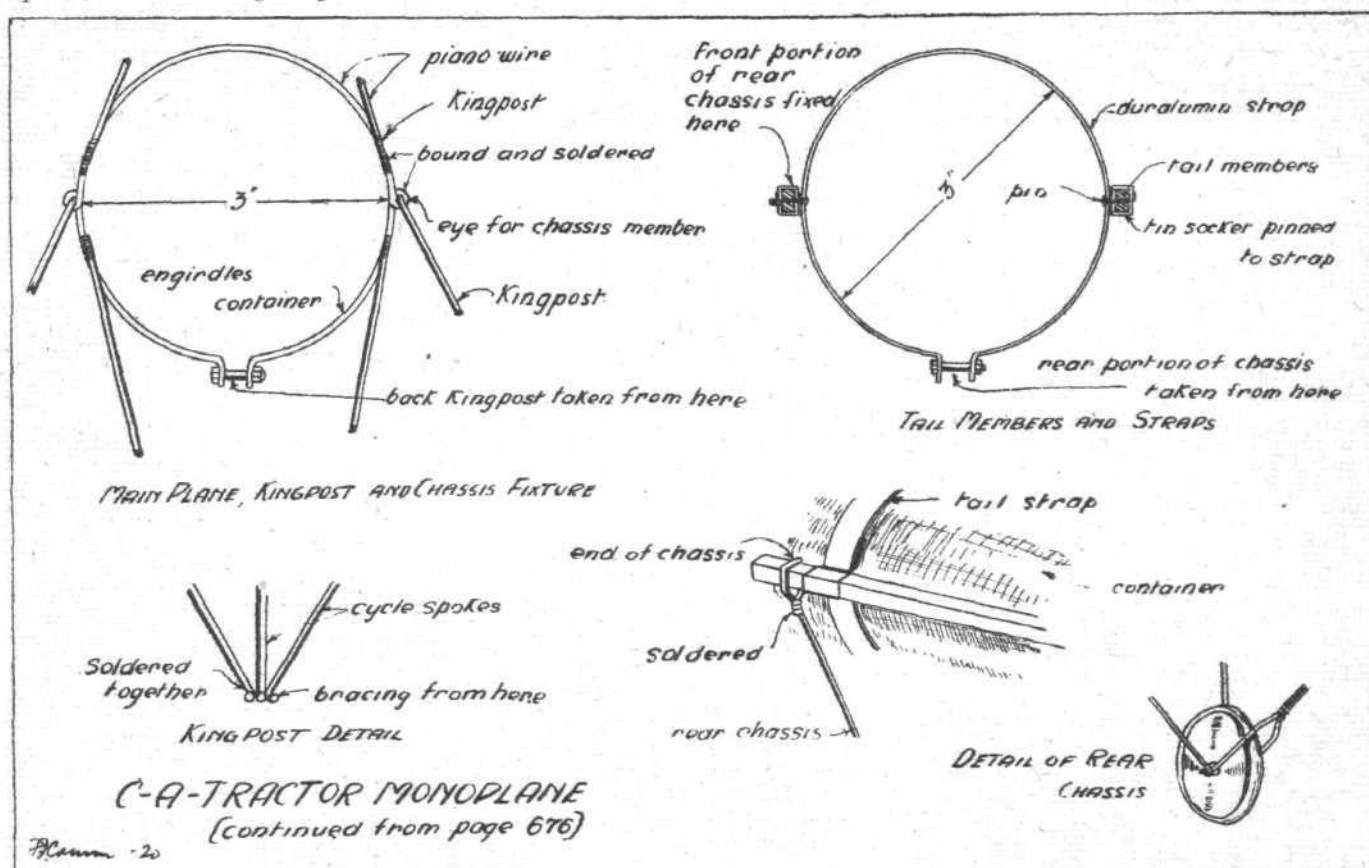
Main Plane and Tail Fixtures.—The details here presented show the method of securing the planes and chassis to the container. Four piano-wire bands (18 S.W.G.) engirdle the container at their respective positions (see the side elevation of the model given in *FLIGHT*, June 17), and are drawn taut by means of drawbolts as shown. The two carrying the chassis have eyes formed in each side, the chassis members (cycle spokes) being soldered into them. The heads of the spokes, of course, abut the eyes. The two front kingpost members are soldered to the wire band securing the front of the plane, whilst the single top and bottom rear members are

The front arms of the rear chassis are fixed, as shown in detail to the projecting ends of the tail bearers, and the back members of the rear chassis to the drawbolt of the rear duralumin strap.

(To be Continued)

A Model Club for Brighton

Mr. W. C. ORFORD, of Staverton House, Buckingham Road, Shoreham-by-Sea, Sussex, wishes to get into touch with enthusiasts between Brighton and Worthing with the idea of forming a club. Now is your chance, then, Brighton enthusiasts.



looped to attach to the drawbolt of the wire band carrying the trailing edge of the main plane. I have made the drawing to appear as if the chassis is taken off the same member as the kingposts; this is done to save space, and it will clearly be understood that this is not really so. The kingposts are taken off the bands carrying the main plane, the latter being attached by right-angular shaped pieces of piano-wire, one arm of the angle being soldered to the band and the other being bound with wire and soldered to the extending ends of the leading and trailing edges of the wing spars; this fixture will be dealt with in greater detail later on.

Attachment of Tail Members and Chassis.—The tail members are fixed to duralumin straps engirdling the container as illustrated by means of pinning, the pinning passing through thin bands wrapped round each member at the point of attachment, the heads and points of the pins being lightly soldered to prevent moving.

The Aviette Trials

Two attempts to win the Peugeot prize of 10,000 francs for the first man to fly 10 m. in opposite directions, propelled by his own force, were made on June 25, but both ended in failure. One of the machines, that of M. Jannary, has a propeller worked by the hands and feet, while ascent and descent are controlled by the forward or backward movement of the body. Unfortunately, part of the machine broke,

The Olympia Aero Show

I WOULD take this opportunity of again reminding readers of the notice in last week's issue with reference to the above. Entries should be sent in at once.

Replies to Correspondents

C. J. A. (Kingston-on-Thames).—I duly forwarded your letter to Mr. Groves.

C. H. C. (Brighton) and R. C. (Croydon).—We replied direct to your letter.

H. J. (Stroud, Glos).—We replied direct to your letter.

G. O. (Bowes Park).—Many thanks for the drawings and particulars of your model, which we are using in an early issue. Please send the details you mention of gliders.

O. W. K. (Leatherhead).—I am dealing with your suggestion, subsequently. Many thanks.

necessitating the trials being postponed indefinitely. But, in any case, as we have asked before, to what end?

Another French Aviatress

A FOURTEENTH lady has now qualified for an aviation pilot's licence in France. This is Mlle. Gabrielle Deshayes, who passed her tests at the Brequet school at Le Crotoy. She started flying in 1917 at Lyons, and will shortly be leaving for Holland to carry out a series of exhibition flights.

SIDEWINDS

FROM Mr. L. J. Hamblen, of Yeovil, the Triplex Safety Glass Manufacturing Co. have received the following telling testimonial:—"On the 19th inst. I had a serious spill, being thrown from a fast solo machine as the result of a burst front tyre. At the time I was wearing the pair of Triplex safety goggles, Model A3, which I enclose. By the condition of the left glass you may be able to judge of the force of which my head struck the road. You will notice that the glass is starred in all directions, yet there is no loose splinter of any kind, both surfaces of the glass feeling perfectly smooth. I got off lightly with bad bruises and a cut head sustained in striking the road, but the eye and its socket were undoubtedly saved by the remarkable quality and workmanship in your goggles."

THE Handley Page Indo-Burmese Transport Co. is one of the latest developments of British aircraft enterprise. The authorised capital of the company is 1,50,00,000 rupees, which at the current rate of exchange equals about £1,500,000, and ordinary shares to the amount of £188,000 have recently been offered for public subscription. The company is under the auspices of the London Handley Page Co. and acquires the sole agency for the sale of Handley Page aircraft and accessories in India and Burmah, also for the sale of aircraft and accessories recently acquired from the Imperial Government by the Aircraft Disposal Co. Lieut.-Col. J. A. E. Edwards, C.M.G., is the first managing director, and Capt. H. R. Clarke, A.F.C., assistant general manager. The primary object of the company is to obtain subsidised Government contracts for the conveyance of air mails in India and Burmah, and until the contracts are secured it is intended to carry out passenger flights and short services, the latter with a view to establishing at a later date permanent services to suit the requirements of the public.

ANY Package, any Weight, by Air Anywhere has been suggested as the motto for the new departure in the forwarding department of Messrs. Harrod's Stores. In future, goods purchased in any department of this establishment will be forwarded by aeroplane to Paris or Brussels at the request of the buyer. Parcels handed in at the export department will also be accepted from the general public, and packages of any weight will be despatched at short notice to any destination by special aeroplane service by arrangement.

TWICKENHAM, at 9 a.m. on Saturday last, was a very animated scene when four motor chars-à-bancs assembled to motor far afield the employes of the well-known firm The Dissolved Acetylene Co., Ltd., South Lambeth Road. Mr. L. M. Fox, it was very early evident, had spared no trouble to ensure a successful outing and his proverbial luck—it was a magnificent day—was once again with the party in spite of it being the firm's thirteenth outing. The route was via Ripley and Guildford to Hindhead, returning after an opportunity to admire the beautiful country through Farnham, Maidenhead to Windsor, where dinner was served. The chair was occupied by Mr. L. M. Fox, who, responding to the toast of the firm, proposed by Mr. Huddle, paid eloquent tribute to the work of the whole of the staff and hoped every member had thoroughly enjoyed the day's proceedings as he himself had; he hoped it was by no means the last of motor char-à-banc outings, as they were a distinct success. By special invitation, the whole party visited Mr. L. M. Fox's house at Staines and then returned to the starting point, thus ending a very pleasant and happy day.

If the inhabitants of other provincial towns were as keen on aviation as Bury St. Edmunds, flying would become a national pastime. The Central Aircraft Co. had two machines there for a week early in June giving passenger flights, and so great was the success that the town authorities approached the company with a view to their visiting Bury again. This has been arranged, and for the next two weeks Bury will be able to indulge in flying to their hearts' content. Services will also be run during the week in connection with the Newmarket Meeting.

THE Central Aircraft Co.'s seaplane season at Southend bids fair to establish new records for that popular seaside resort. The Mayor of Southend opened the proceedings on Saturday last by making the first flight, and so keen was he that he insisted upon going up again during the afternoon. It was his first time in the air, and, to quote his

own words, it was the greatest "have another" proposition he had ever known. Over 150 visitors to Southend enjoyed the pleasure of a seaplane flight last week.

OVER 100 passengers were carried by the Central Aircraft Co. last week in "Centaur" machines, mostly flights over London. A large number of Americans saw London from the air, and they all agreed that it was "Some City," and an experience that should not be missed by all good Americans.

AT the Central Aircraft Co.'s School of Aviation last week, Miss Imelda Trafford took her R.A.C. Certificate and Air Ministry's "A" Licence, being the third lady-pilot to take her ticket since the Armistice, two of the three being trained at Northolt.

NEW COMPANY REGISTERED

ELLERD-STYLES AND CO., LTD.—Capital £2,000, in £1 shares. Acquiring business of an electrical, mechanical and aeronautical engineer, etc., carried on by W. Ellerd-Styles at 287, Upper Street, Islington. First directors: W. Ellerd-Styles and L. F. S. Young.

AERONAUTICAL PATENTS PUBLISHED

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motors

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